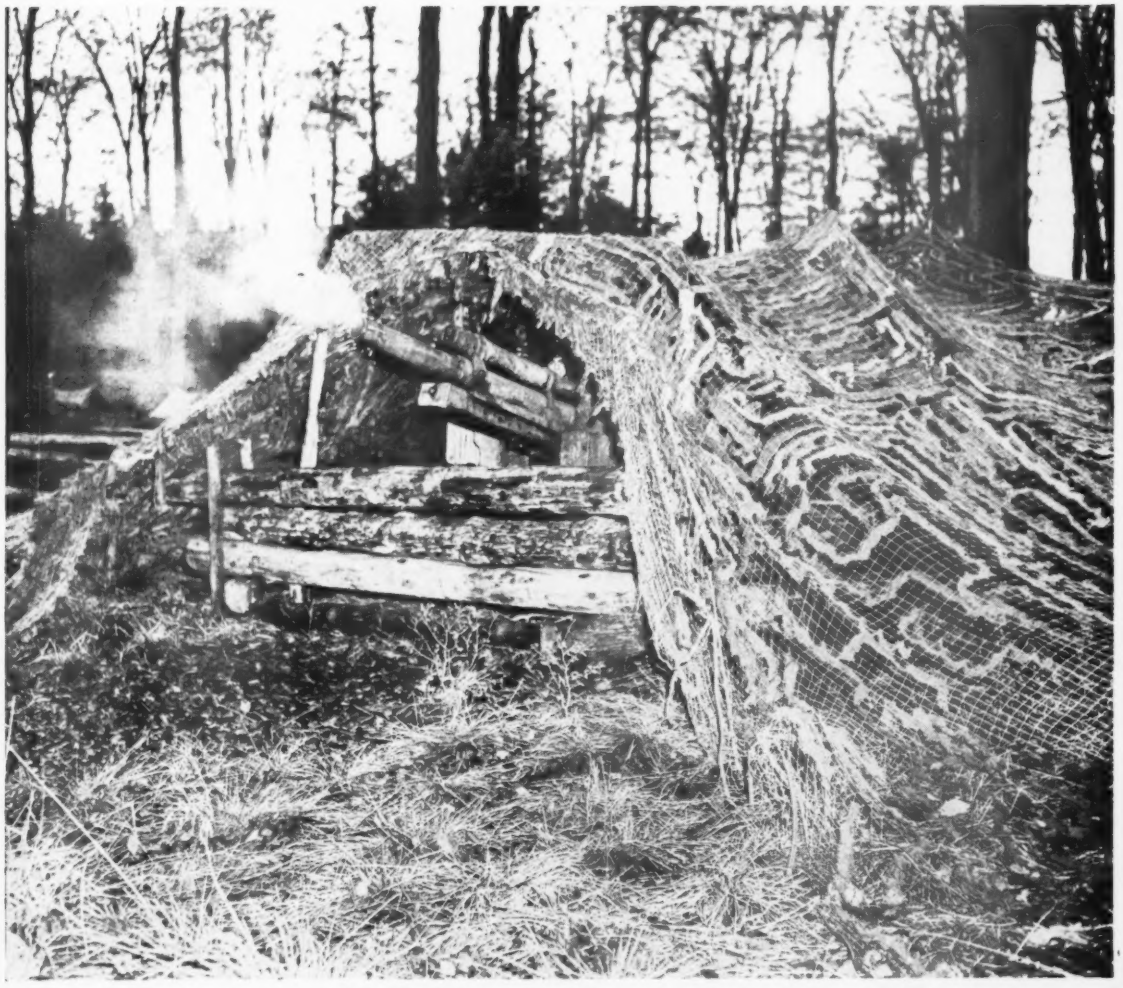
The FIELD ARTILLERY Journal



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V-E DAY has just passed. After the carnage and destruction of the past five years, eight months, and eight days, the whole of Europe has been officially freed. Only isolated pockets of resistance remain to be cleared. The light of liberty is waxing again. Our Allied forces are victorious.

But this is no time for self-congratulation. Tremendous jobs still lie ahead. Although a good many troops may remain in Europe for some time to come, many others will soon begin their trek to the Pacific.

This shift of emphasis to the Orient will require much reorientation of troops and units. Living and battle conditions in their new theater will be far different from those to which these troops have been accustomed. New tactics and new techniques must be mastered.

Old-timers in the Pacific have learned the ropes there. They will be invaluable as instructors. But you needn't wait until you cross the Date Line to take advantage of their experience. They are steadily contributing invaluable material to these pages. See to it that your men and your fellow-officers have available enough copies of the *Field Artillery Journal* to go around. Get in as much indoctrination as you can, as early as you can. That will speed later operations and also minimize casualties.

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MANY UNITS have a high percentage of membership. Our real thanks to those interested officers and men. To others we say, why not survey the situation and take steps to assure widespread distribution of the *Journal's* battle lessons among your commands?

ON OUR COVER is a 105-mm howitzer firing from the Huertgen Forest west of Dueren, last November.

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The Field Artillery Journal

JUNE, 1945—Vol. 35, No. 6

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Organizing Artillery Battalions in China

By Col. Donald Q. Harris, FA

Due to the limited amount of artillery in the Chinese Army it has been necessary to equip and train artillery battalions in a steady procession, since the start of the Chinese-American military training cooperation. There was supposed to be one artillery battalion per army — manifestly inadequate, but in many cases even this artillery battalion was not existent or had no weapons or equipment. As the available artillery battalions were equipped and trained at the Field Artillery Training Center, and since the need of more battalions was evident, it was decided by the Chinese Government and the American Military Headquarters to organize, equip, and train new pack artillery battalions at the FATC. This is, of course, only part of the planned artillery program.

To implement this program the Chinese Recruiting Service was notified to procure a large number of recruits for delivery on call. As there is no selective service in China, the task of collecting these recruits at one time in one locality is no mean one. The Chinese Remount Service (called the "Sino-American Bureau for Animal Purchase") had the task of buying and delivering mules and horses. As it was necessary that some of these be large enough to carry the Phillips Pack Saddle (Cav. Mod.) and the various loads of the 75-mm pack howitzer, many of the mules had to be purchased at distant localities and transported to the FATC. The animals of the locality in which the FATC is located, while sturdy and with plenty of courage, are generally too small to carry the prescribed loads. Even the largest mules are smaller than the accepted standard demanded in the American Army. It is just as well, however, because the packers are small too.

As a training nucleus for these battalions, 36 officers and 100 enlisted men were selected from each of eight units and enrolled in the Academic Department of the FATC. The officers, of grade from Lt. Col. to 2nd Lt., were given the straight Battery Officers' Course of nearly two months. This consisted of instruction in conduct of fire, communication, animal transport, materiel, and massing of battalion fire. The enlisted men were divided into specialties and given instruction in them. Classes were organized for horseshoers, communication men, survey and instrument men, pack masters, stable sergeants, and firing battery (chiefs of sections and gunners).

During these courses the officers and men were evaluated. Just prior to the completion of the course, eligible officers were picked according to their aptitude and academic standing to serve as battalion commanders and in other key positions of the battalions to be trained. Officers were also selected for another battalion that was to be equipped but not trained at the FATC. The officer cadres for the battalions above-mentioned were completed by an equitable distribution of the officers remaining after the key officers were selected. Enlisted men were equally divided by specialty. The system as outlined appears to be very similar to that used in the American Army.

EDITOR'S NOTE

In this *Journal* for June, 1944, Col. Garrison B. Coverdale told of the establishment of the Field Artillery Training Center in China. Col. Harris ably describes the work being done there. We look forward to publishing accounts of the battle work of the units formed and trained there under American and Chinese officers.

Arriving recruits cross the bridge by the FATC.

Five of the battalions had these allotments:

	Officers	*Men*
1st Bn	38	89
2nd Bn	37	94
3d Bn	27	89
4th Bn	32	88
5th Bn	39	90

In the American Army an individual has loyalty and pride in his unit, but if transferred to another unit he acquires loyalty and pride in his new unit. In the Chinese Army there is no easy transfer between units except in the same army. Sometimes a soldier escapes (deserts) and reports to another army in which case he is accepted without question—at times even junior officers do this; but otherwise there is no transfer.

Therefore, when individuals were allotted to another cadre other than that to which the bulk of the men from their old unit were allotted, these individuals either joined the unit they desired or failed to report at all and returned to the unit from which they originally came. All efforts on the part of the American liaison officers to equalize the cadre strength of battalions ended in failure, the only result being acrimonious discussion on the part of the Chinese.

Thus the number of officers and enlisted cadremen that actually reported in the battalions that I examined were:

	Officers	*Men*
1st Bn	36	56
2nd Bn	39	58
3d Bn	31	119
4th Bn	35	63
5th Bn	43	58

These results were not too disastrous as far as the officers were concerned—but as for the enlisted men, several battalions were badlly crippled in some departments. There was a scarcity of horseshoers in one battalion, a lack of instrument men in another, and so on.

Do not try to reconcile the two lists. For example, one battalion promoted 10 of the cadre sergeants to be officers, other battalions received 30 men from their old unit as a donation, another battalion received 8 officers in the same way. In other words, the Americans planned the equitable distribution of cadremen but the Chinese took care of it in their own way. Just one of the problems to be solved.

While the cadres were still undergoing academic and specialist training the animals started arriving. The Sino-American Bureau for Animal Purchase delivered them to the FATC subject to acceptance by the Veterinary and FA personnel (American) at the training center. The animals were inspected for soundness and size suitable to carry the prescribed load. Out of the first shipment many were rejected on a

count of such physical impairments as bad feet and legs and sore backs, and size too small to use.

On 17 Jan 44 the officers and men of the cadres moved to the training battalion area and reported to me for duty. Some battalions were assigned billets in the Training Battalion Compounds. Others were assigned to villages, one of which was at about 7 kilometers from the FATC. It might be stated parenthetically that it is the Chinese Army custom to billet in villages, moving out or crowding up the villagers.

At this time also, American Liaison Teams (consisting of three officers: a major, captain, and lieutenant, and three enlisted men: a staff sergeant and two sergeants) reported for duty to assist in organizing the battalions and supervise the subsequent instruction. According to present plans these liaison teams will instruct the battalions to which they are assigned, supervise the training of the officers and men, and accompany the battalions to the field when the preliminary training at the FATC is complete. By obtaining the confidence and respect of the Chinese with whom they work, the American Liaison Teams can have a decided influence on the utilization of these battalions in combat and can practically assure that the Chinese artillery uses the best artillery doctrine.

On the date that the cadres reported for duty, both the local Chinese Headquarters and the American Headquarters were informed that a large number of recruits were available at the recruit station for delivery to the battalions at the FATC. A request was made to higher headquarters to obtain medical personnel to examine, vaccinate, and inoculate the new men.

As far as could be ascertained, previous to this time there had never been any attempt to classify the Chinese soldier before he was assigned to a unit. Believing this necessary, I outlined a plan to classify, allot, and distribute the recruits about to be received and instructed Maj. Joe M. Robertson, FA, and Maj. Chiang to work out the details and supervise this classification. As a certain degree of education was needed for instrument and survey men, communication men, gunners, and chiefs of sections, it was decided to classify and distribute equally those that could read and those that could not. Since the battalions were to be pack units, it was decided to classify them further as large or small (strong or not strong).

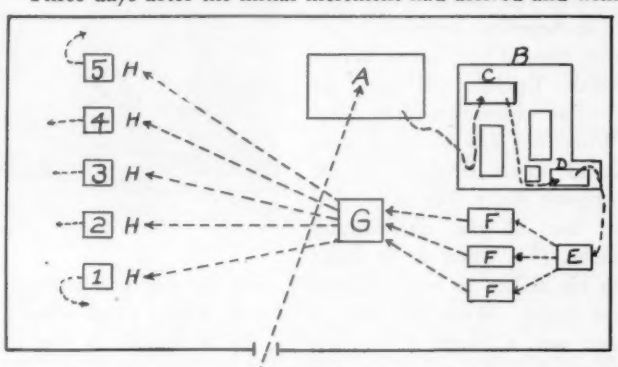
A colonel was detailed from the Chinese Headquarters to procure the recruits; transportation to transport them was obtained from the American Service of Supply. On arriving at

The Chinese dispensary is neat, clean, and orderly, and has a lovely little garden.

General Ho, Chinese commander of the Center, addresses a group of recruits.

the recruit station the Chinese colonel, accompanied by an American officer and an interpreter, found that instead of the expected number of recruits waiting to be transferred to the FATC there were only one-third present, and of these only slightly more than half were acceptable and fit for duty. As no one, Chinese or American, seemed to know whence or when the remainder of the fillers would arrive, those available were transported to the FATC and assembled for processing.

Three days after the initial increment had arrived and with



no further information from any higher headquarters, it was noticed that the roads approaching the FATC were filled with long columns of marching soldiers. The same thing was repeated two days later, when other fillers arrived.

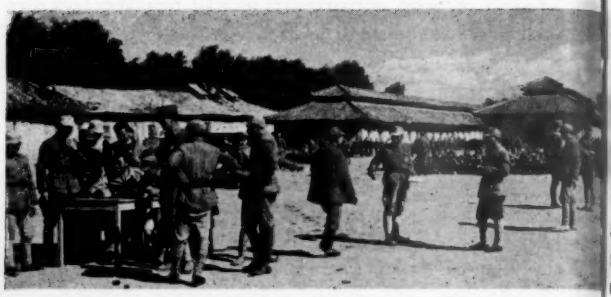
As mentioned before, each group was classified before assignments were made to the battalions. How the assignment was accomplished may be understood by reference to the accompanying sketch, which shows the cleared space in the Compound in which three battalions are to be quartered. Once again we use five battalions for illustration.

As the recruits entered the Compound they were grouped together for waiting until time for processing. In one of these locations, such as "A," they were addressed by the FATC's Chinese Commandant (General Ho) or one of his representatives, and told of the procedure to follow. When this discussion was complete the men were started through the processing in groups of twenty. Let us follow one "Jin Ping" called Wong through the processing.

Wong first enters the Chinese Hospital enclosure (B) and finally the Dispensary (C), where in turn he receives vaccination and inoculation for cholera and typhus, is examined for rupture or hernia, and has his heart and lungs examined by a

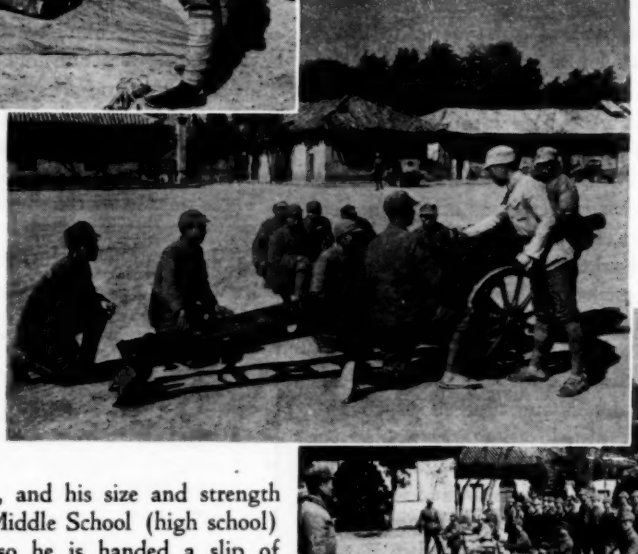
Chinese doctor. Probably the medical attention he receives in the room in the short time he is there is more than he has received all his life. Slightly bewildered, Wong is directed to the bath house (D), where he is given a sulphur painting for scabies. This treatment is repeated as needed throughout his stay at the FATC. About 95% of the men examined needed some degree of scabies treatment.

After redressing, Wong goes to an American sergeant at "E" who tries to find out if Wong speaks English and could be used as a substitute interpreter. Wong nor any of his fellows could speak English, so the sergeant directs him to proceed to one of the classification tables (F), where he is tested in his ability to read (Chinese), and his size and strength are noted. Wong had been to Middle School (high school) and was a North China boy, so he is handed a slip of paper with his name (in Chinese) and the notations "R" (read) and "L" (large) on it. He takes this paper to assignment table (G), where, according to his classification, he is allotted to the battalion needing this classification. The allotment of men was done by a Chinese American officer of the United States Army who speaks both English and Chinese which expedited this phase of the classification.



Battalion guides direct new soldiers to their assigned groups, in rear

When Wong was assigned to a training battalion a guide from it led him to the assembly area for that battalion (H2). From here he was taken to the kitchen, where he was given his bowl of rice. After eating Wong was assigned by the battalion commander to a battery and by the BC to a section and a duty. Of course, his classification card was noted and his assignment to duty made accordingly.



Top left: These recruits are learning how to manta two cloverleaves of ammunition.

Center: Operation of the 75-mm pack howitzer is explained.

Below: A Chinese officer is directing this instruction on the aiming circle.

Saddling with the Phillips pack saddle (Cav. Mod.) is explained. Note the extreme smallness of the animal.

As soon as the first increment of recruits were received and assigned, a directive was issued to the FATC Ordnance and Supply to start issuing equipment to the battalions. Each battalion was scheduled on a different half-day. Each battalion drew 12 howitzers, necessary pack equipment and the authorized signal and communication equipment.

Even before our fillers had arrived, the ones on hand were out learning the fundamentals of the duties of cannoneers, drivers, and communication and instrument men. The training of the battalions had started.

TRENDS in Field Artillery Organization & Equipment

Although this column announces only approved changes, it does not constitute authority to requisition personnel or equipment listed herein.

By Maj. Shirley B. Metzger, FA, and Maj. Irvine F. Belser, Jr., FA

A revision of the Rocket Battalion Tables of Organization and Equipment is now in the hands of The Adjutant General for publication and distribution. With the publication of this revision the Rocket Battalion definitely joins the Field Artillery family. Title of the table becomes "Field Artillery Battalion, Motorized, 4.5-Inch Rocket, Truck-Drawn," and units will be designated as "—— Rocket Field Artillery Battalion."

Organization of the Rocket Battalion now corresponds more closely to standard Field Artillery organization. The number of rocket batteries has been reduced from 4 to 3 per battalion, with a corresponding reduction of rocket launchers from 48 to 36. Additional fire direction and survey personnel have been included, and communication facilities have been increased. Because of the high rate of fire of the rocket launcher and the resulting problem of ammunition supply, ammunition carrying vehicles have been considerably increased. More than 7 rounds per tube can now be carried as a basic load, as compared with 4 rounds per tube in the old tentative organization.

Fire direction in the Rocket Battalion is now handled in the rocket batteries rather than in the headquarters battery as in standard field artillery procedure. The battery fire direction center, which controls the 2 rocket platoons of 6 launchers each, will function similarly to the usual field artillery battalion fire direction center, while the rocket battalion headquarters will perform the roles ordinarily performed by higher headquarters in standard artillery fire contol, such as assignment of missions, etc.

The next published change to T/O & E 6-29, Service Battery, Motorized, Field Artillery Battalion, 105-mm Howitzer, Truck-Drawn, dated 27 Sep 44, will include one (1) Truck, 4-ton, 6x6, wrecker, complete with equipment, in lieu of one (1) Truck, 2½-ton, 6x6, cargo, SWB, with winch, and one (1) Tool Set, second echelon set No. 7, hoisting and towing, now authorized.

Army Service Forces QM Supply Catalog 3-4 is being changed to list wooden stirrups (less the leather hood) of the type furnished the Saddle, McClellan, M1928, as an additional component for the Saddle, military, Phillips', with a remark stating that either the ordinary steel stirrup or the wooden stirrup may be requisitioned according to the desire of the unit concerned. Advantages of the wooden stirrup in cold weather operations are greater warmth, increased width to accommodate the shoepac more comfortably, and less likelihood of rubber soles slipping or hanging when the rider dismounts.

A new classification of radio operator, to be known as "Operator, radiotelephone, fire control," has been approved. This new type of radio operator is to replace all Operators, radio, low speed (776) now included in field artillery tables of organization except those operating CW sets. The radiotelephone operator must be able to set up, operate, and perform first echelon maintenance on radio sets such as the SCR-608 and SCR-619, must have knowledge of fire control terminology and procedure, but will not be required to know code transmission.

Changes have been approved to replace the Board, drawing, 31 x 42-inches, with folding trestle, with the Board, drawing, 42 x 60-inches with two adjustable trestles, in T/O & E 6-56, Headquarters and Headquarters Battery, Motorized, Field Artillery Battalion, 155-mm Gun, 8-Inch Gun, 8-Inch Howitzer, or 240-mm Howitzer, Truck-Drawn, or Tractor-Drawn, or Self-Propelled, and in all heavy field artillery firing batteries. The Straightedge, steel, one edge beveled, graduated in yards, 1/20,000, 24-inches, to be used in connection with the standard 26,000-yard range deflection fan, has been approved for inclusion in next published changes to T/O & E 6-56 and T/O & E 6-397, Field Artillery Battery, Motorized, 240-mm Howitzer, or 8-Inch Gun, Tractor-Drawn, on the basis of two (2) per T/O & E 6-56 and one (1) per T/O & E 6-397.

Allowances of the Tube, flexible nozzle, in all tables are being increased to include one (1) per range, field, M1937, in addition to present authorizations of one (1) per truck, tractor, or airplane.

FIELD MANUAL 21-6

A good lawyer can't quote you all the law or remember too many decisions, but he can without hesitation reach up to the shelf and haul out the appropriate book dealing with a particular question.

So it is with a motor officer in regard to maintenance publications. He should know what technical manuals and bulletins are up to date. It has been learned that many officers are not familiar with authorized maintenance publications and War Department Lubrication Orders covering the equipment of their outfit.

A maintenance officer should be certain that his headquarters has on file the publications that cover equipment pertinent to his unit.

With the publishing monthly of FM 21-6, War Department Field Manual with lists of training publications, a commanding officer is given at least half a chance to know what is old and what is new in regard to technical manuals and bulletins. FM 21-6 lists Field Manuals, Firing Tables, Lubrication Orders, Mobilization Training Program, Technical Bulletins, Technical Manuals, and Training Circulars. To be on the ball with up-to-the-minute manuals you should be sure that this monthly new FM 21-6 reaches you every month.

The purpose of FM 21-6 is to provide as completely as possible the full list and index of War Department training publications. The practice of issuing changes in the form of monthly supplements to this manual has been discontinued. FM 21-6 is being published monthly as a recurring manual and includes all changes up to the time of publication. It is like a new telephone directory. Publications issued during the previous months are indicated in the current FM 21-6 by an asterisk. Hence, it is easy to check your files. Commanders who are responsible for maintaining sets of publications are urged to have them checked periodically against the list of supersessions and recissions which are printed in each monthly issue of FM 21-6.

Maintenance of a file is required of a commander whether the unit is a company or higher echelon. Proper maintenance of a file means having on hand the publications which deal with particular equipment of your unit, and keeping these files up to date. Missing manuals or other publications necessary for the upkeep of equipment of a command should be procured without delay from an Adjutant General Depot or other appropriate issuing point.

It is suggested that files be carefully checked and requisitions only for missing copies be sent out. Keeping too many copies of a particular manual will deprive another unit of that manual. Units have been known to selfishly order whole sets of files when they needed only a few copies.

A mechanized war is a fast-changing war in physical position, in models of equipment, and in procedures of administration. FM 21-6 in its latest form and with its monthly issue should be a great help in keeping abreast of changes in training publications.

Methods For Improving Jungle Radio Communication

By Col. J. R. Wheaton, FA

Reports from theaters of operation reveal that radio communication in jungle terrain is frequently far from satisfactory. Heavy, wet, dense growth absorbs ground radio waves, the normal transmission path for tactical military radio. Ever-present thunderstorms with high atmospheric noise level are also deterrents to satisfactory radio communication. Although FM radio sets of the SCR 600-series are not appreciably affected by atmospheric disturbances, they are subject to reduced range resulting from jungle growth.

One solution to combat jungle conditions involves increasing the power of transmitters. Since transmitter output must be multiplied many times before an appreciable gain is detected at the receiving set, sufficient increase of power to produce noticeable results is impracticable.

Another solution involves elevation of radio sets above jungle growth. This method utilizes a transmission path above the jungle growth. In experiments, the rated range of the SCR-610 (five to seven miles) has been increased to 60 miles by elevating the set 1,000 feet. Hence, whenever available, extensive use of hilltops for radio locations is indicated.

Increased reliability and range will result from raising antenna systems fed from radio sets operating on the ground. This may be accomplished by use of field expedients which have been tested and require only equipment readily available.

Satisfactory radio communication may be obtained when antennae are elevated on trees, poles, or a combination of both. When trees are not available for antennae support, several lance poles can be lashed together with wire W-110 to form a mast (see Fig. 1). To gain additional height, a light bamboo pole can be fastened to the end of the lance poles.

Since the mast must be guyed, several pieces of wire W-110 cut to lengths not electrically resonant with the antenna may be used. The several lengths are tied end-to-end using square knots, meanwhile avoiding metallic connections. Guys are fastened to the pole, it is raised into position, and the guys are staked firmly to the ground.

Construction of a radiating antenna is the next problem. Since conductivity of the system is a principal consideration, antennae should be constructed of the best materials available. Copper wire, solid or strand, is preferred. Wire W-110 will give satisfactory results when better materials are not obtainable. Spliced conductors should be avoided since all splices must be well soldered. In experiments, excellent results were obtained using a half-wave center-fed antenna. The length of a half-wave antenna in feet may be found by using the formula *468/Freq. in Megacycles*. Although field strength tests indicate that antenna length is not critical, antennae must be shortened several inches when erected less than 40 feet above the ground. To obtain satisfactory results, proper selection of site and elevation of antenna to clear foliage is necessary.

Although not usually available, non-resonant coaxial cable of any convenient length proved to be the best transmission line for feeding the antenna. When this cable was connected to the center of the half-wave antenna, impedance of the feeder line and of the antenna at this point were nearly matched. This arrangement results in transfer of energy with minimum loss (see Fig. 2). The antenna is constructed of two quarter-wave lengths of W-110 wire separated by an insulator. Each side of the transmission line is connected to half the antennae. The coupling to the radio set may be varied somewhat; a single turn of insulated wire around the center of tank coil L2 was employed with the SCR-609 and SCR-610 (see Fig. 3). Link ends were twisted for a short distance before emerging from the case through the tuning well. One link lead was connected to the outer conductor (shield) of the coaxial cable and the other to its center lead. "A7" and "B7" must be tuned to resonance as indicated by the panel meter (resonance dip is reasonably broad). When the SCR-608 was employed, the

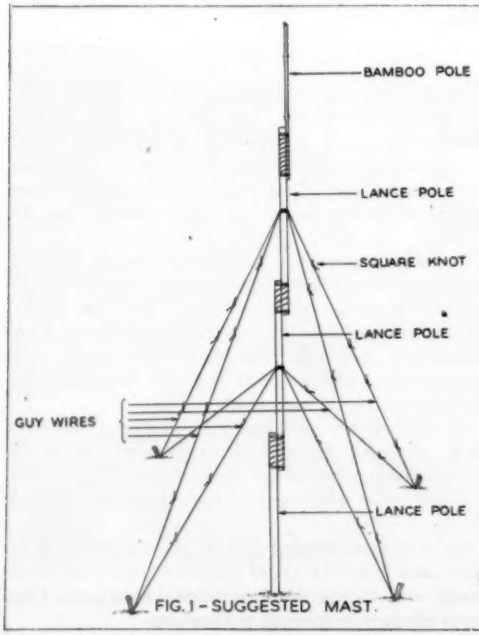


FIG. 1 - SUGGESTED MAST.

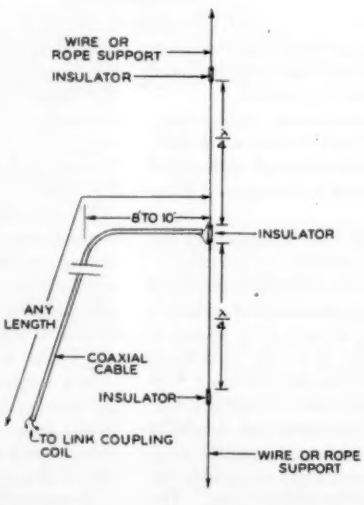


FIG. 2 - HALF-WAVE CENTER-FED ANTENNA WITH COAXIAL CABLE LEAD-IN

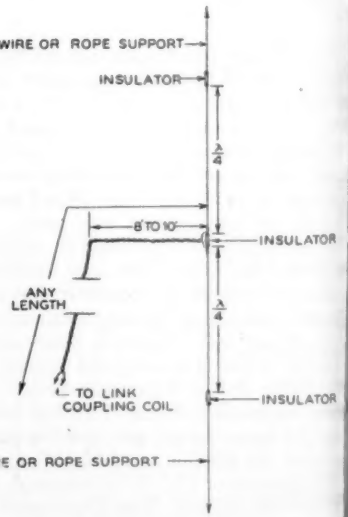


FIG. 4 - HALF-WAVE CENTER-FED ANTENNA WITH W110 B LEAD-IN

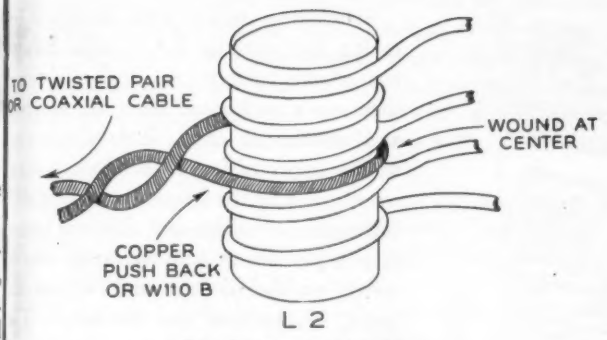


FIG. 3-LINK COUPLING FOR COAXIAL OR TWISTED PAIR FEED

coaxial cable was connected directly to ANTENNA and GROUND binding posts. This necessitated adjustment of antenna trimmers and L111 for maximum transfer of energy from transmitter to antenna.

If the coaxial cable is not available, twisted pair transmission line may be used. This may be constructed of W-110 wire, or twisted pair lamp cord. The transmission line is non-resonant and may be any convenient length. W-110 wire is more durable than lamp cord under all weather conditions.

The twisted pair transmission line was coupled to the plate coil L2 of the SCR-609 or SCR-610 with a single turn of wire in the same manner as outlined above, or was connected directly to ANTENNA and GROUND binding posts on the SCR-608. Although this type transmission line is somewhat less efficient than coaxial cable in unfavorable weather, losses were not excessive. When installing either type, care must be taken to run the feeder line for several feet at right angles to radiating portion of the antenna in order to keep the line away from the field of the antenna.

This discussion of antenna systems is concerned with FM radio sets only. The expedients outlined above will improve operation of amplitude modulated sets giving a better signal-to-noise ratio, which tends to overcome the high level of static encountered in jungle regions. Through use of these improvised methods radiation efficiency may be somewhat reduced, although masking effect of jungle growth is somewhat overcome.

PACKBOARD FOR JUNGLE COMMUNICATIONS

By Capt. George W. Reitz, FA

Jungle operations present unexpected difficulties for Field Artillery communications sections when vehicles cannot be used because of either the terrain or restrictions placed on loading in amphibious operations. Many of the problems encountered by our battalion in maintaining communications were solved by use of the packboard. Ideas developed during the Hollandia operation were used in the subsequent Biak operation, with excellent results. Use of the packboard gives the man carrying it free use of his hands and his weapon. In addition to laying wire and carrying the SCR 610, the packboard was used for carrying extra wire and batteries.

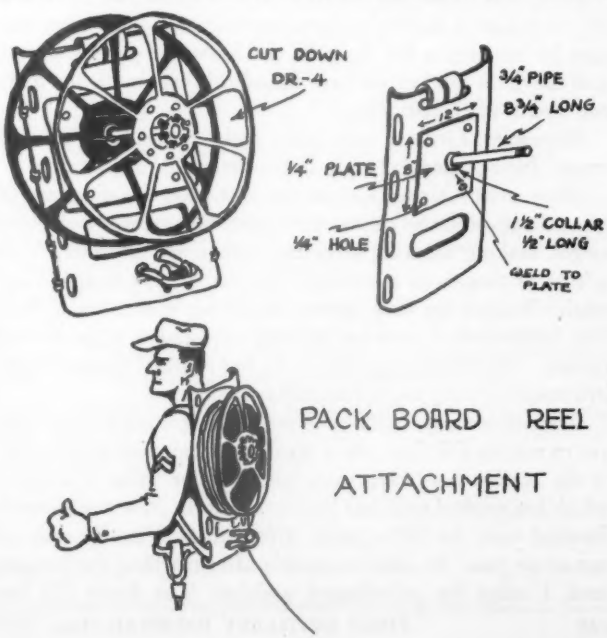
WIRE

Great difficulty was experienced during the Hollandia operation in maintaining both wire and radio communication between forward observers and liaison officers accompanying infantry units, and the supporting artillery. Wire W-130 was laid initially by forward parties and was replaced by wire W-110-B as soon as possible by battalion wire crews.

Wire laid along existing trails and roads was continually broken by improvement of roads. The field order specified the side of the roads on which wire would be laid, but because of the terrain it was often impossible for road improvement operations to be carried out without damaging the wire. Wire was not laid well away from the roads in early phase of the action because of the dense undergrowth and steep hillsides. Interruptions to communications were caused by the felling of trees, blasting operations, and burning brush piles, all incidental to road building.

Obviously the answer lay in wire routes at least several hundred yards away from the existing roads, which of course entailed breaking a new trail and maintaining security for the wire party from snipers and enemy patrols. Security was obtained by using detachments from an infantry platoon which had been assigned to the field artillery battalion for a perimeter defense. The actual laying of wire W-110-B was a bigger problem. The idea of using a packboard for laying wire was developed after the operation was stabilized. Special authorization for issue of packboards was obtained and the wire laying attachment shown in accompanying sketches was improvised from scrap materials.

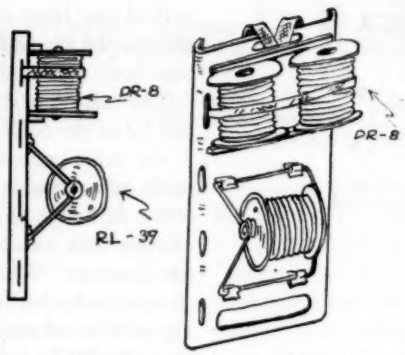
As issued, the DR-4 weighs 22 lbs. By cutting out the side panels and the center spool, and welding the six supporting bolts to the side plates, the weight was cut in half. The total weight of the complete unit with ½ mile wire W-110-B is thus about 82 lbs. Weights are broken down as follows: packboard, 5 lbs.; attachment, 6 lbs.; modified DR-4, 11 lbs.; ½



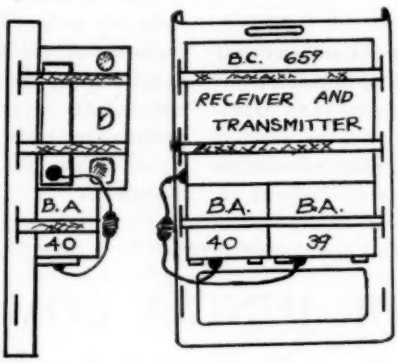
mile wire W-110-B, 62 lbs.

This is admittedly a heavy pack, but for extremely difficult terrain the amount of wire carried on the reel can be reduced. Extra wire was carried on packboards by other members of the wire party. Personnel laying the wire were rotated after each drum of wire was laid. Wire can be laid as fast as the man can make his way through the jungle. Machetes, climbers, and a compass are indispensable items of equipment for a wire party of this nature.

FO parties used the packboard for laying wire W-130 as they went forward with the infantry. The reel RL-39 was mounted on the packboard and extra drums DR-8 were carried on the same packboard. See sketch.



W-130 mounted on packboard



B.C. 659 mounted on packboard

Radio

The packboard has also proved invaluable for portable operation of the SCR 610 radio set. Field artillery forward parties had a great deal of trouble keeping up with the infantry when they made periodic reports back to the battalion headquarters, because of the time consumed in coupling up the receiver, transmitter, and battery box. Also, the two radio cases were very awkward to carry.

Satisfactory results were obtained by taking the batteries BA-39 and BA-40 out of the battery case and mounting them on a packboard with the receiver and transmitter case. This eliminated trouble previously experienced when wires were broken by the frequent coupling and uncoupling of cables. All that was necessary to put the set onto operation was to set the packboard down and connect the aerial, microphone, and headsets. The latter two were carried in a waterproof bag, tied to the set.

Weight of the radio, batteries, packboard, and waterproof cover carried in this manner is 56 lbs. The weight of the radio as issued is 59 lbs. As the receiver and transmitter weight is 30½ lbs. and the battery box weighs 28½ lbs., this method both cuts down the total weight of the radio and provides greater ease in carrying. The operator's personal equipment and spare batteries are carried on another packboard by the assistant operator. Loads are rotated frequently.

All of these packboard uses were put to test in the Biak operation and resulted in very satisfactory communications between the artillery forward parties and the battalion headquarters and FDC.

EARLY LUZON EXPERIENCE

By Capt. J. Richard Hearn, FA

These few notes are written by a 155-mm M1 Howitzer BC in a Corps Artillery Battalion, with the hope that they may be instructive for those in the States or on the way to join us. This is what we have found this war to be like after one month of campaigning:

Movement: Little or none after dark, especially in forward areas. No occasion for night displacements or occupations.

Observation: Almost exclusively done from the air. Lack of ground opposition to cubs enables observer to hover right over target, making shooting extremely simple and accurate. This is true of targets at any range that the present weapons can reach. Targets are very hard to find from plane, but if location is definitely known on the map adjustment is simple and certain. Sound ranging, I am told, has resulted in some excellent results during night counterbattery fire.

Communications: After one month of campaign, we have yet to run an OP line. As a result our communications within the battery have been quite simple. The usual procedure, which has worked well, has been to bring the ¾-ton wire truck forward with the BC's party. Often the CP can be pointed out as we pass. As soon as possible after reaching the position area, I select the switchboard position. The direct FD line can then be run by truck using W-110. In the meantime the local line to the perimeter defense guns, executive post, battery CP, and sometimes the kitchen are run in, using W-130. We always try to pick up our W-110, but the lighter wire in the local setup is not usually recovered as it is needed until the last minute for control and defense against infiltration. Radio, used only for displacements and for air-ground communication, has worked excellently when used. There is nothing new or difficult about its use here—the simpler the better. By the way, we have made a practice in many danger spots of servicing no wire outside the battery perimeter, after dark. We simply revert to radio until dawn. Things which move outside the perimeter after dark are viewed with great distrust.

The firing battery: Much of our work is counterbattery and calls for extreme accuracy. The excellent aerial observation in addition to the flat terrain and green fields, gives the observer certain knowledge of the performance of the gun crews. Each round leaves a doughnut in the ground and the doughnut remains as evidence of bubbles that were not leveled, aiming posts that were not in line, and similar offenses against the laws of good shooting. These things were pointed out very early to the gun crews and I know that being convinced by one who actually saw the results on the ground and could

graphically describe them, did a lot to make the men take more care. Constant reminders and constant actual checking by the executive are still necessary, of course, but the checks turn up remarkably few errors of even a minor nature. No amount of theoretical talk has the results of factual demonstration which the men cannot but believe and gladly accept and act on.

We have fired charge seven almost exclusively and as a result have run into considerable displacement. Experience has taught my executive that the actual realignment of the aiming stakes, even for only small amounts of displacement, pays off in both results and reputation with the air observers. Leaving all the petty mathematics aside, as well as the position and distance of the stakes from the gun, every fraction at the gun shows up many times multiplied 15,000 yards out. Speed is relatively unimportant, we find, and the realignment can be accomplished with very little delay when the men are on their toes. We knocked the tube off and destroyed a Jap GPF the other day, which is a matter of considerable pride to the gun crews of course, and this we are sure is a result of the great care which everyone takes in each small operation. These guns are really close to perfect for accuracy.

Some outfits I've seen seem to use the telephone lines to the pieces for exec control to quite a degree. My exec and I are firm advocates of visual control under all possible circumstances, as nothing else gets the proper results. There are few instances here, even at night, where visual control is not possible and preferable.

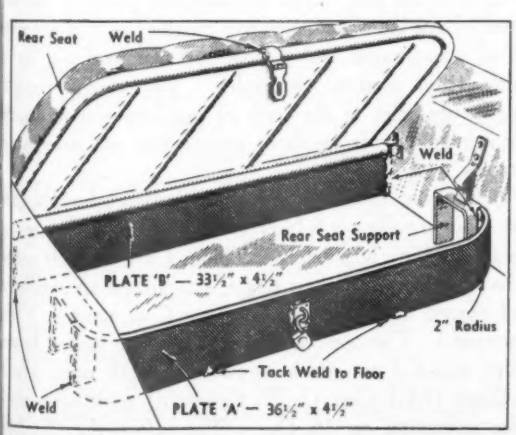
By keeping the GP radio on the air-ground channel the exec can listen in on the observer's sensing and transmit to the gun crews immediately the accuracy of their firing and sometimes the results. Nothing is of greater morale importance in the whole battery than getting the news of the results of the shooting of a section, battery, or battalion. It will do more for the functioning of the firing battery than all the checks and pep talks ever made.

One experience of ours in firing a preparation might be instructive. We received a schedule one night for a half-hour preparation, firing mostly at maximum speed, charge seven. Two concentrations were to be fired through. The shift to both concentrations was about 300 mils right. On the suggestion of one of my chief of sections—they can still teach any of us things and they will keep doing it if they are properly considered and consulted—I relaid the battery and recorded base deflection about 300 mils left of the center of traverse. The results of this move, which allowed us to do all our firing straight through the center of the trails, were obvious the next morning. We had trouble keeping all pieces in during the 30 minutes but not as much trouble as others, and I'm sure our accuracy was considerably improved.

If someone tries to sell you trail logs to ease your trail shifting you will strenuously resist the sales talk, if you want to profit by our experiences around here. They just aren't the answer, at least not here.

One more thing—be prepared to select gun positions where you can cover about a 2500*m* sector by merely shifting trails —and if someone asks you to turn around 3200 mils don't be worried and don't think you are the first one to have done it.

Housekeeping: This department I consider a unique contribution and probably as important as all the previous departments together. Anybody who thinks that attention to details (including cleanliness) is left behind in the states is in for quite a jolt. Let's mention just a few points that are just about SOP with us now. The battery CP, tent, foxholes, beds and mosquito bars, firing charts, clothesline, washstand, musette bag racks, and whatnot go in at the same time and with the same speed and efficiency as the firing battery occupies position. Positions for the men to pitch their cots and shelters are selected with great care and exactness, taking into consideration neatness, nearness to guns, camouflage, shade, and defilade. Each section follows its own SOP in putting in these installations. Ammo is scrupulously cleaned, oiled, and prepared for firing. Everything must be off the trucks and off the ground. That means everything—including helmets, carbines, musette bags, and what-have-you. All clothing must be kept clean all the time and must be changed daily. Count on building a washing machine and fixing up a portable shower during the first break you get after hitting the beach, and then be sure that both of them are operating as per a published schedule within a few hours of the time you hit each new position. Windshields are wiped off immediately after the vehicle is used, and *each* time. The motor officer reports within a matter of a few hours after each displacement, that all motors have been thoroughly checked, lubricated, and cleaned —and I really mean cleaned just as you mean it back in garrison. Everyone must wear a complete and proper uniform at all times except when sleeping with proper authority. That means a shirt, too.



Lt. Todd's jeep tool-chest, built under the back seat. Reverse lend-lease from Canadian Army's CAM magazine.

"ARMY MOTORS" ON JEEP SEATS

Here's something we ran across in the Canadian Army's maintenance magazine, CAM. Looks like the best bet yet when it comes to rigging up a tool box under the back seat of the ¼-ton jeep, which is something many a jeep driver has been yearning for for years.

Lt. R. H. D. Todd's idea is to weld a plate onto the floorboard at the front edge of the rear seat, and another across the back, to keep the tools from rolling out. The seat lifts up on its hinge and, with a padlock attached, forms a lockable lid for your improvised tool compartment.

The drawing herewith shows you the whole setup. All you need is about one man-hour and:

1 mild-steel plate, 36½ " x 4½" x $\frac{3}{16}$"

1 mild-steel plate, 33½" x 4½" x $\frac{3}{16}$"

1 hasp and staple, 3"

1 padlock

Shake well while using—and you still won't be losing your tools.

Artillery in the Bougainville Campaign

By Capt. John C. Guenther, Inf

Seizure of Bougainville in the Northern Solomons, establishment of three air strips, subsequent aid in neutralization of Japan's formidable bases on Bougainville, New Britain, and New Ireland from these strips, and the successful defense of our beachhead on Empress Augusta Bay—these marked the end of major operations in the Solomons. Gen. Harmon had run out of islands. But the Solomons worked out well as the proving ground for the methods of beating the Japanese which had been worked out by our Pacific Theater commands. The ratio of casualties in that campaign, better than 30:1 in our favor, speaks for itself.

The critical point in our superiority over the Japanese was the degree and success of our coordination, essential to which was the employment of the artillery. On the basis of this argument the operations of the 37th Division Artillery and of the Artillery Group Headquarters established and commanded by Brig. Gen. Leo M. Kreber are an important chapter in the textbook of jungle warfare evolved by the American Army in battle.

Interesting features of the shooting from the artilleryman's point of view include:

We threw everything we had at them.

We killed Japs at a ratio of 30 to 1.

A Division Artillery Headquarters acted as Corps Artillery Headquarters, making the transition without a hitch, and carried on its primary mission concurrently.

Seacoast, antiaircraft, naval, and chemical warfare weapons were all used as corps artillery.

Fires were massed at will.

90-mm AA guns were used for direct-laying counterbattery fire.

The light observation plane made its first appearance in the theater.

Artillery observers worked in Marine Corps TBFs, SBDs, and PBYs.

Artillery headquarters had its own photo intelligence section, which included a Navy officer detailed to us and enlisted men from the S-2 section.

In developing American ground tactics against the Japanese it was obviously necessary first to learn all that the Japanese had already discovered, then to improve upon Japanese methods until our countermeasures gave us a man-to-man and weapon-to-weapon advantage that would prove decisive. The pattern of Japanese operations as contrasted with the departments in which our greatest potential superiority lay posed an immediate problem that was to prove fundamental in the Pacific war.

A 90-mm AA gun on Hill 608 is being used as a field piece against Hills 1111, 1000, 600, and 250 on Bougainville.

Getting ashore through the rollers on 17 Nov 43

Japanese tactics were adapted to the primitive character of the jungle itself. They took full advantage of the wretched standard of living in Japan and the consequent experience of the population in living like beasts. Troops were frequently called upon to live off the land and to prepare their own rations individually. The small patrol—the isolated unit—was the basic element in their operations. Coordination of large units was a matter of advance planning only. The details of an operation might be worked out minutely and each role down to the last private, rehearsed again and again. But once the action was launched Japanese troops had but two alternatives: to carry through to the successful conclusion of the original plan without deviation, or to be killed.

Our army, on the other hand, had the basis for superior equipment and organization. In materiel and in engineering it had the prospect of decisive advantage. Its more powerful weapons could blast the Japanese if they could be brought to bear. It was a question whether modern war could hold its advantage over primitive war in surroundings where nature was all on the side of the primitive.

The first actions shed little light. Our forces were pitifully small, our equipment incomplete, our supply lines at best intermittent. The enemy was on the offensive, calling the tune. All we could do was meet him on his own ground, on his own terms, and pray. But even then we were studying and planning how best to exploit the advantage when the time came for us to call the tune and choose the time and place of battle.

The secret of our later success in this theater lies in a greater perfection of coordinated and mechanized war and not in a retrogression from modern principles. The virgin jungle places greater obstacles in the path of ponderous machinery and heavy armament. It yields to genius that can overcome those obstacles.

The 37th Division (Maj. Gen. Robert S. Beightler) began landing on Bougainville on 8 Nov 1943. Three days later a field order of the First Marine Amphibious Corps, which commanded the operation in its first phase, established an artillery group and placed Gen. Kreber, DivArty Commander, 37th Div, in command. The composition of this group varied from time to time and did not reach its peak strength until after the XIV Corps (Maj. Gen. O. W. Griswold) took over control of the operation on 16 Dec. Thereafter the flexible groupment organization was always able to control not only the two division artilleries and certain corps units, but naval

and other ground forces' weapons as well. During the heaviest fighting on Bougainville an Artillery Group-controlled volley aggregating nearly 4½ tons could be directed at ground targets. The units comprising this striking power, together with details of their weapons, are shown in Fig. 1.

Organization	Basic Weapon	No. of Btrys or Platoons	No. of Weapons	Weight of Projectile (lbs.)	Weight of Volley (lbs.)
37th Div Arty	155-mm How	3	12	95	1,140
37th Div Arty	105-mm How	9	36	34	1,224
Americal Div Arty	155-mm How	3	12	95	1,140
Americal Div Arty	105-mm How	9	36	34	1,224
3d Def Bn (Marine)	155-mm Guns	2	8	95	760
49th CA Bn	155-mm Guns	2	8	95	760
Destroyer, USN	5" Guns	---	5	40	200
Destroyer, USN	5" Guns	---	5	40	200
—— AAA Bn	90-mm Guns	4	16	23	368
3d Def Bn (Marine)	90-mm Guns	4	16	23	368
Can Co, 129th Inf	75-mm How	3	6	14	84
Can Co, 145th Inf	75-mm How	3	6	14	84
Can Co, 148th Inf	75-mm How	3	6	14	84
Can Co, 132nd Inf	75-mm How	3	6	14	84
Can Co, 164th Inf	75-mm How	3	6	14	84
Can Co, 182nd Inf	75-mm How	3	6	14	84
—— Chem Bn	4.2" Mortars	6*	36	25	900
TOTALS			226		8,788
Aggregate Volley in Tons					4½

*Company B was not present during actions described.

Figure 1

Group Artillery Headquarters was identical with 37th Division Artillery Headquarters. Staff officers under Gen. Kreber served in the same capacity for the group. At its beginning the Artillery Group included the 12th Marine Divisional Artillery and a famous Field Artillery battalion, three battalions of 75-mm pack howitzers, and one battalion of 155-mm guns. Its control over additional units was progressively put into effect as such units arrived.

Early Problems

Survey, ammunition supply, and communications were the first problems to be worked out. The Corps Air Force, the Division Engineers, and Corps and Division Signal units provided the cooperation required.

Maps available in advance were inaccurate in details and wholly useless so far as vertical control was concerned. Aerial photographic service was rapid and excellent. Survey was plotted and scaled on the map and checked by previously-selected terrain features. For the general support plan a firing template was drafted to provide a common language for all cooperating weapons, whether field artillery, coast artillery, AA, infantry, chemical warfare, or naval.

The template consisted of a 1:30,000 sketch or overlay showing grids and the trace of our front lines, including boundary points between units. The area forward of our lines to an average depth of 3,000 yards was then divided into rectangles 400 yards wide and from 1,000 to 1,500 yards deep. These were based on a YY-line roughly parallel to our front. Coordinates accurate to 10 yards were noted for the termini of the line and for each point where it changed direction. Each 400-yard plat, across the entire front of the battle position, was assigned a designating letter. By using the template any unit, no matter what its system of fire control, could compute data for fire into any of the plats within range, and hold such data ready for instant use upon receipt of an order for a fire mission.

Aerial photo service was rapid and extensive. It was of inestimable value to the artillery. The plan followed was:

(1) The preparation of a controlled mosaic and a terrain map from photos taken prior to the occupation of the area.
(2) Registration on selected "air spot check points" immediately upon occupying the area.
(3) Periodic air photo coverage during the operation.
(4) Immediate distribution of these periodic coverages to interpreters attached to Corps G-2, Division G-2, and Group Artillery S-2 sections.
(5) Rapid dissemination of interpreters' reports and annotated photos to interested parties.

Both vertical and oblique photos were taken of the area before occupation, and made available for stereoscopic study of the terrain. These formed the basis of the photomap and the terrain map, both of which were issued beforehand.

Later in the operation obliques taken from Cub planes at low altitudes assisted the infantry materially in patrolling, identifying objectives, and designating targets.

Ammunition supply was governed by the available road net. The speed with which the Engineers carved roads out of the jungle solved this problem almost before it arose. Many soldiers will tell you that it is the bulldozer that is winning the war. Certainly the speed with which these lumbering machines cut through the Bougainville jungle played a vital role in our victory there. Excellent drainage, due to the volcanic ash and sand which made up the soil, helped speed the road net. Even in the case of the 4.2" mortars—for which some 30 battery positions were laid out, some so far forward that they were between bands of protective wire—no hand-carry greater than 300 yards was required.

Rapid installation of the communications net made possible the early effectiveness of groupment control. First concern of Group Headquarters was to coordinate the registrations of the two Division Artilleries and the massing of supporting fires. The headquarters installation was close to Division Headquarters and linked by direct wire to Corps G-3. Direct wire to coast artillery units was established upon their arrival. The

Concussion from this piece, caught in recoil, stirred up dust clouds all around the position. This photo was taken 6 Mar 44, during the Jap attack on our perimeter.

Island Net sufficed for communications with the navy base and AAA Command.

Many and unusual fire control hook-ups were used. Often they included Corps and Navy boards. Example: Cub plane over target relaying to another Cub closer to base, which in turn worked with the Group Artillery FDC, which relayed to 155 gun battalions by wire (they having no 600-series radios).

Sometimes the coast artillery battalions reversed the lend-lease on radios and relayed for us, as their sets worked well with observers in Marine Corps planes. Occasionally Navy radio would help out, contacting night spotters in PBYs.

Very little simplexing was done. Group FDC had a BD-72 in the dug-out, along with 608 and 284 radios. There were direct lines to all battalion FDCs, the other division FDC, the CA battalion, AAA Control Center, G-3, and the Cub strip.

Operations

As early as Nov. 17th destroyers carried out fire missions under Group control. We had no airfields at that time, so observers were flown out of Munda. Needless to say, it was a little difficult to brief observers based that far away, but only occasionally did they have to return without accomplishing a mission. Failures were mainly due to a plane's radio going bad in flight.

Between 17 and 23 Nov the 135th and 136th FA Bns and the first 155-mm guns arrived. Registration of all units was completed, using artillery observers detailed to Munda and operating from SBDs.

On 24 Nov the 3d Marine Division launched a coordinated attack on the right of the battle position. Seven battalions fired a 30-minute preparation. The 12th Marines then gave direct support while the battalions from the 37th Div fired missions of interdiction, neutralization, and counterbattery. Next day the foot troops advanced through the shelled areas. They found that several hundred Japs had been killed by the artillery. A PW subsequently stated that most of those who escaped death or injury in the impact areas had to be taken from the line due to extreme neuroses.

On 25 Nov a number of Japanese 15-cm shells landed in areas within the perimeter. Group Headquarters coordinated air, land, and sea searches for Japanese gun positions, followed by counterbattery fire by the 155 guns. Suspected Japanese artillery OPs were also investigated and interdicted.

On 29 Nov Marine paratroopers undertook a raiding mission in the coastal area about 6,000 yards east of our perimeter. This battalion ran into strong enemy forces and was roughly handled. A forward observer from the 155 guns, who had gone on the raid, adjusted fire for his guns; heavy shelling after dark successfully covered the withdrawal of the parachute forces.

By this time artillery missions were growing more frequent and varied. At the same time that two destroyers bombarded the Japanese whom the paratroopers had found, heavy concentrations were laid down by the artillery upon other groups of enemy located by the photographic intelligence unit which operated under the combined 37th Division and Group Artillery Headquarters. On this same day the one infantry regiment was stopped by strong enemy forces operating near the division boundary. An artillery battalion was brought in on the area and gave fire support throughout the day and night. The following morning the 135th and 136th FA Bns joined it in a 10-minute preparation, blanketing the area where the Japs had been discovered. After the preparations the infantry moved in with little opposition, finding only scattered Jap bodies.

On 2 and 3 Dec three battalions of the 12th Marines and the 135th FA Bn operated on Japanese gun positions near Mavavia, directed by the air spotter working with the marines. Twenty volleys were poured in on the first day, heavy fire again on the second. Japanese guns and an ammunition dump were knocked out. At the same time the 155 guns scored a direct hit on a heavy Jap gun at the mouth of the Jaba River, an achievement which was confirmed by PI a few days later.

Three artillery liaison planes arrived on 4 Dec and were installed on the Torokina air strip. SBD operations were transferred from Munda to Torokina. Air observation was set up under Artillery Group control with a 37th DivArty officer in charge and observers assigned from the various artillery battalions.

An incident on 6 Dec emphasized the mutual cooperation between the different arms. The 37th Reconnaissance Troop was one of the many agencies engaged in missions from which the artillery worked out its missions. A long-range patrol from this unit had penetrated 20 miles beyond the perimeter and was in the vicinity of Ibu, far from any base of supplies, their mission not yet completed, and running short of rations. Artillery liaison planes delivered more than a ton of supplies by air drop.

These slow and unarmored little craft were put to many expedient and unorthodox uses throughout the Bougainville campaign, an expansion of their capabilities made possible by the extent to which the Japanese forces were scattered and their weak, frequently non-existent air defense. The rule prohibiting these planes from flying beyond the front lines and over enemy territory was waived. The soundness of this move was borne out by the fact that only one liaison plane was lost by enemy action. Their operations' effectiveness was greatly enhanced. They were successful in a wide variety of missions over remote jungle areas and made a large contribution to our file of enemy information.

By this time the compilation of enemy intelligence was reaching a point where it was invaluable not only in guiding current operations but in laying plans for future action. Close-in and remote patrolling, air observation, photographic intelligence and its interpretation, and interrogation of PWs and natives were yielding a complete picture, its details cross-checked by evidence from two or more of these sources. Locations of trails, river crossings, routes of approach, bivouac areas, supply installations, barge landings, entrenchments, and gun and mortar emplacements were pieced together to disclose the Japanese order of battle and the course and timetable of their intentions.

The action in which the Marine Division captured Hill 260 on 15 Dec tested the coordination of our supporting fires. Units in contact reported the enemy was building up strength in the low ground between Hill 260 and Hill 600. Action was initiated on 13 Dec. Fires of the 12th Marines were supplemented by the 135th, 136th, and another FA Bns. The following day one battery of 155 howitzers from the 136th made a lateral displacement of 7,000 yards into the zone of the other division to positions from which it could fire on the southeast nose of Hill 260, a critical area that had previously been dead space to our artillery. One platoon of 4.2″ mortars, its strength increased from six to seven weapons by borrowing one of the spares carried by the company and stealing men from

the regular squads to improvise one additional squad, also supported the action.

The steadily increasing effectiveness with which all the disparate units (from destroyers and antiaircraft guns to infantry 75s and chemical 4.2s) were tied into cooperative action, was aided by two principles to which the Artillery Group Command adhered throughout. One was that available channels

"On the trail to Numa Numa"—men of the 148th Inf of the 37th Div advance behind tanks on Bougainville.

should be maintained and alert at all times for the transmittal of orders and missions from the highest echelon to the lowest and most remote. The other was that coordination and cooperation, within the plan of these channels, should be carried out at the lowest level at which effective liaison was available.

The chemical mortar companies, attached to infantry regiments, were placed under the control of artillery battalion commanders in the planning of fires and supplemented our fires throughout the campaign. They operated superbly, and fired over 59,000 rounds during the action.

The 90-mm AA guns were used on ground targets throughout the campaign. By what hocus-pocus they figure data for unobserved fires cannot be told, but they do it successfully and their night fires were extremely useful in harassing and interdiction. Their day in the sun really came in March, however, when the Group Commander had them emplaced in direct fire positions on Cannon Ridge and Hill 608, where they destroyed many Jap guns 3,000 yards across the valley on Blue Ridge and Hill 1,111—by direct laying on the muzzle flash. They seldom had to shift more than a mil or two, and after a few rounds the Jap emplacement was readily visible and equally readily destroyed.

All the units controlled by the artillery were at the peak of perfection as the March attack of the enemy drew near. For several days before the enemy initiated his ground attacks, as his preparatory movements increased, fires were maintained around the clock, night and day.

The following quotation from the 37th Division Artillery Report After Combat summarizes the action during the enemy attacks:

"The enemy's five major attacks were broken and several attempts to reform the other attacks were dissipated.

"The 135th Artillery Battalion distinguished itself by its effective support of the 145th Infantry, breaking up the Jap major attacks on Hill 700 and Cannon Ridge. The —— Field Artillery likewise distinguished itself by its marvelous support of an infantry regiment in breaking up the major attacks on their front.

"The 136th Field Artillery Battalion, in general support, fired incessantly on all threatened fronts and brought its fires in closer than ever before. It set a record of over 2,500 rounds in one day. The 140th Field Artillery Battalion, while having no direct Jap threat in the 148th Infantry sector, was constantly busy with general support and counterbattery missions."

Assumption of command by XIV Corps (Maj. Gen. O. W. Griswold) on December 16 ushered in a period of stabilization and consolidation of the perimeter. No change was made in the Artillery Group, save that Marine units were withdrawn. The headquarters set-up remained the same throughout. Readiness for the next move of the enemy kept pace with the flow of fresh details as our intelligence built up the picture of the major attack the Japs were planning.

The words of the Marine Artillery Commander upon leaving sum up the spirit of cooperation shown throughout the entire campaign. He said, "We feel that the efficient technical conduct of the Artillery Group of the Bougainville forces has not only been an example of exceptionally smooth operation between two units of different Federal forces, but it is also evidence of a spirit of comradeship and cooperation worthy of the best traditions of the United States military forces."

Lt. Gen. Kanda, commanding the Japanese 6th Division (reinforced), opened his attack on the Empress Augusta Bay perimeter at first light on March 8th with his artillery, emplaced along the ridges overlooking the American perimeter. These guns were sited for direct fire. Forward observers

Artillery fire literally cleared away the jungle ahead of our infantry. It cleared away almost all the Japs, too, but enough hid out to give a work-out to the flame-throwers, such as that shown here being carried across a ford by a mopping-up patrol.

quickly adjusted an artillery battalion and a cannon company; later the other three battalions of the 37th Division were brought in.

Increasing patrol pressure in front of the 145th Inf pointed to an attack on the front of the 2nd Bn. It was learned that the 23d Japanese Infantry was massed in this area clear back to the ridge from which the Japs were firing. Four battalions, the Cannon Company, and 4.2" mortars joined in a counterpreparation upon an area 1,200 by 2,000 yards, inflicting a heavy toll.

During the night of 8/9 March the enemy crept in to the right of these fires and occupied the north slope of Hill 700, potentially crucial commanding ground. Fighting raged for four days, both sides clinging to positions within a few feet of

each other on the crown of the hill. The Japs immediately behind their little spearhead on top of the hill were on the steep reverse slope. All our division artillery brought down its fires on the low land beyond the bottom of the hill. This box barrage held back enemy reinforcements and successfully isolated the hilltop. By 11 March the force of the Japanese attack had been blunted. On the 12th the 135th and 140th Bns, the Cannon Company of the 145th Inf, and the 4.2" mortars fired a 10-minute preparation. The infantry counterattack which followed restored and extended our original lines.

On 11 March the enemy made a new attack 1,000 yards to the left, directed at the position of Co G 145th Inf on Cannon Ridge. All the 37th Division Artillery units and one battalion of the Americal concentrated counterpreparation and then close-in defensive fires in this area, and in the afternoon fired a counterpreparation in support of the successful counterattack launched by our infantry.

This ended the offensive efforts of the 23d Jap Infantry. But there were four other Japanese infantry regiments facing the perimeter, three of them massed in depth opposite one of our regiments on the center of the Division position. Here the terrain was jungle lowlands cut by occasional shallow ravines. The Japanese attack shifted to this area on 12 March, concentrating on the 2nd Bn, center unit of the regiment. On the night of 11/12 March patrol reports showed this attack was imminent. Close-in defensive fires were laid down in front of our position, in spite of which the Japs succeeded in a slight penetration of the Co G lines. Counterpreparation by the 136th and another FA Bns, the Regimental Cannon Company, and the 4.2" mortars preceded a successful counterattack.

The enemy spent several days gathering strength and making dispositions for heavier attacks. Our division artillery divided its fires between counterpreparation in the areas where enemy forces were forming up, and counterbattery. The counterbattery continued night and day throughout the entire period of the Jap attacks. All the units of the Division as well as the larger weapons of the Artillery Group were in action without let-up through March. It was not until the night of 1/2 April that a program of rest for any of the battalions could be started.

On the morning of 17 March began the final series of Jap attacks. The enemy penetrated the lines of Co F. The same program of artillery-fires-and-counterattack restored our lines. In this sector the battle see-sawed for the following week. Early in the morning of 24 March the Japs made their strongest attack and deepest penetration. They came up a small ravine and got well in behind our front lines during darkness. The 136th, 140th, and another FA Bns' fires completely cut off Jap exploitation of the breach they had made. Before noon the enemy was driven out in an infantry-tank counterattack which restored our lines.

The Japs then planned a last, desperate attack, throwing in all their remaining available troops. This attack never materialized. Our intelligence reported not only the "when" of the projected attack, but the "where" as well. Armed with this information, Gen. Beightler went to Gen. Griswold with a request for extra allowances of ammunition and for priority call on all the artillery within the perimeter. Both requests were granted, and at 1800 the mass firing opened up. More than 4,000 rounds were fired into the enemy's forward assembly area during the first 15 minutes, and 14,882 rounds altogether. A few dazed Jap survivors stumbled into our lines the next morning.

Jungle positions like this cannot be located from any distance. Behind this 10-cm Jap field piece is a protecting dugout well concealed by dense foliage.

Though there was no further penetration and no serious attack after this, large enemy forces remained close in front of our lines. Our probing Artillery followed them in their every move as these were reported by our patrols. There was no lessening in the volume of our fires as the enemy weakened. By the month's end the Japs had begun to withdraw. Until 7 April our artillery continued to harass this withdrawal. Patrols kept contact with the enemy, sending back reports of every location where the Japs halted. Artillery fire promptly rained down on them. As the remnants of Jap infantry fell back out of range of our guns the division artillery carried out missions of counterbattery and in support of the Americal Division. By 26 April all was quiet.

Throughout the action the 37th Division Artillery fired 161,968 rounds. All artillery, plus the 4.2" mortars, fired a total of 257,528 rounds in this action. At the outset areas covered by our close defense fires had been jungle so dense that the sun never filtered through to the ground. At the finish these areas were stripped bare—a tangle of tree trunks, withering foliage, and craters. From our lines to the limit of effective range impact areas were filled with dead Japs, some lying where they fell, some buried in common graves hastily dug and filled with from three to six bodies. Reports of prisoners cited infantry companies wiped out by artillery fire, artillery batteries reduced from 130 to 30 men and all their guns knocked out.

The outstanding tactical lesson demonstrated by the 37th Division Artillery and the XIV Corps Artillery Group control in the Bougainville campaign is this:

No matter how close the terrain, all artillery within mutually supporting effective range can be successfully coordinated. This very closeness of the terrain, with the consequent reduction in distances, makes possible more complete coordination at the Corps level than can be attained in the more widely dispersed battle position that obtains in more open terrain.

Japanese artillery on Bougainville did nothing to merit any respect from us. Their common trick of firing when we do is now known to all, and the infantry is beginning to learn that it is not our fire falling short when they hear a burst behind them. The Jap infantry, huddling close to our wire to escape shelling, creates a problem for battalion commanders in planning their defensive fires.

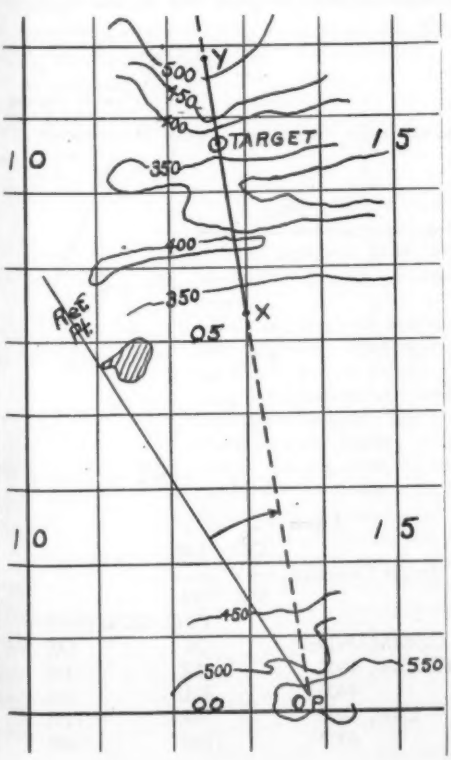
Single OP Observation

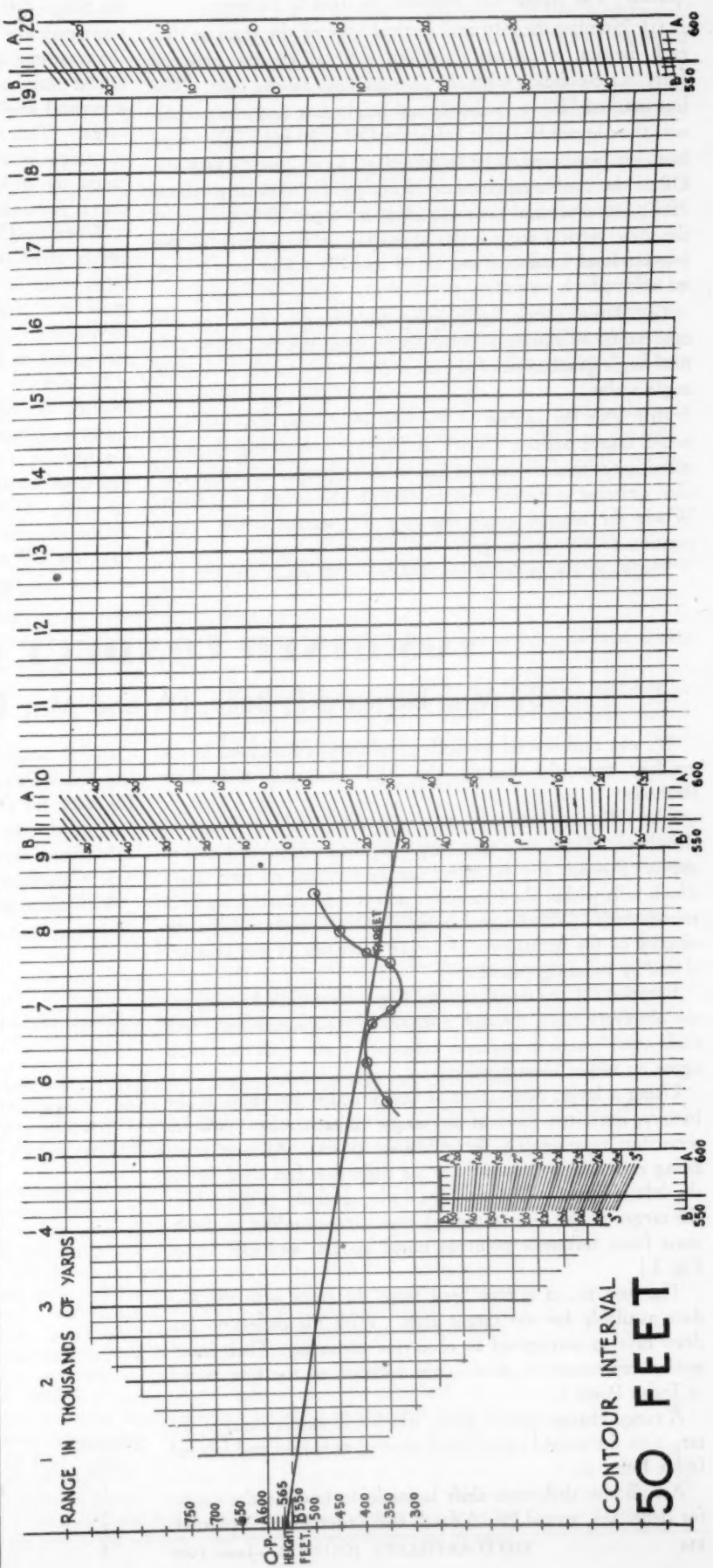
By "Granston"

A simple method of obtaining accurate information on gun flashes and other targets is now being used in Europe. In brief, the system involves *accurate* determination of the azimuth and the vertical angle to a target from a *single* accurately located OP. From the azimuth obtained and the known position of the OP, a ray is drawn on the map; the profile of the ground along this ray is constructed on a specially prepared form. (Since contour heights are all taken from the surface of a sphere, an allowance has been made on the single OP Plotter for curvature of the earth and atmospheric refraction; it is thus accurate even at long ranges.) On this profile the vertical angle from the OP is drawn; the intersection of the vertical angle ray with the profile gives the target range. The target can then be plotted on the map.

To describe the method in greater detail, the range to the target is estimated by the observer as accurately as possible (a trained observer is usually able to estimate well within 1,000 yards at mean fighting ranges), and then a short section of the azimuth line is drawn on the map in the vicinity of the target. (X—Y in sketch.)

Assuming OP height to be 565 feet, the specially prepared form reproduced at right





(called "The Single OP Plotter") is used as follows:

(i) Number the lefthand vertical scale of the form so that each division represents a contour interval (in this case, 50 feet) corresponding with the contour lines on the map. The line marked "B" is the horizontal height line and *must* represent the contour line *next below* the OP (550 ft.). The other lines are numbered to be in accord with this line. Mark the OP at the correct height, i.e., 15 ft. (or 1½ divisions) above "B." Draw vertical lines 1½ divisions from "B" on each of the three vertical angle scales appearing on the plotter (scales between lines 4 and 5, 9 and 10, 19 and 20). The form is now set up to plot a section.

(ii) Draw a line representing the vertical angle (in this case minus 30 minutes) to the target from the OP to the vertical angle graduation of the most convenient of the 3 vertical angle scales.

(iii) Plot the section of the line of country near the estimated target position (X—Y in Fig. 1) by marking the measured range to each contour line at the appropriate height and then drawing a smooth curve through the points so plotted. Where the vertical angle line cuts this section is the target position (7,600 yds. range).

There are a number of precautions to be taken when using the Single OP Plotter. When a target is near a crest the contours may not give enough detail as to the maximum height of the crest and so the vertical angle line may pass over the estimated position of the crest. The observer must therefore give a vertical angle to any lower point on the same slope as the target. This line acts as a pointer to indicate on which crest the target is situated. He should then give the vertical angle to the top of the crest to enable the section to be drawn in so that it just touches the line.

When the OP is on ground where the contours are close together small errors in the map-spotted position will produce large errors in the OP height. In this instance the OP height must be accurately deduced by some other means, such as observing the vertical angle to three known points which can be recognized on the map and whose heights are known.

No definite figure of accuracy for this method of target location can be given, depending as it does on many factors. Accuracy is not dependent primarily on range, however, since a target on a very distant mountainside can be determined with good accuracy. Accuracy is clearly dependent largely on the angle of intersection between the vertical angle and the section of country near the target. The greater the command from the OP and the larger the scale of the map, the more accurate will be the results.

COMBINED CONDUCT OF FIRE

By Maj. Howard F. Buck, FA and Maj. Bert J. Dunlap, FA

We can find several methods of bilateral adjustment in the artillery manuals; namely the "X," diagram and chart methods.

The following method has definite advantages over any of the above. First: it is very simple both to understand and to apply. Second: *fire for effect* can be initiated on any target which falls within the four index points determined from four rounds fired. Third: good initial data can be obtained in the vicinity of the bursts even if target is outside of the area enclosed by indexing rounds.

Locations of the two observers do not have to be known, but the observers must, through a means of communication, "talk each other" onto a common reference point and they must agree on target identification.

Using a large, plain sheet at fire direction center or at the battery, draw two lines at any angle to each other, their intersection representing the reference point. At any point along each line convenient for the deflection fan used, locate the left observer (OL) and the right observer (OR). Plot the target at the intersection of rays corresponding to deviations from reference point as noted by OL and OR. (See Fig. 1.)

The first round is now fired from the piece with the best data available for the target area. With the deflection fan draw rays to correspond to observers' sensings. Their intersection represents graphically the location of the first round or Index Point 1.

A range change only is made which will surely bracket the target on the second round fired, plotted as before and labeled Index Point 2.

A sufficient deflection shift is made to bracket the target for deflection, round No. 3 fired, and Index Point 3 plotted.

Initial range is now repeated without a deflection change and Index Point 4 plotted.

To Solve for Deflection (see Fig. 2):

1. Construct lines 1-2, 3-4.
2. Bisect these lines and connect center points D-D′.
3. Construct line E-E′ parallel to D-D′ through the target.
4. Deflection shift required to place line of fire on target.

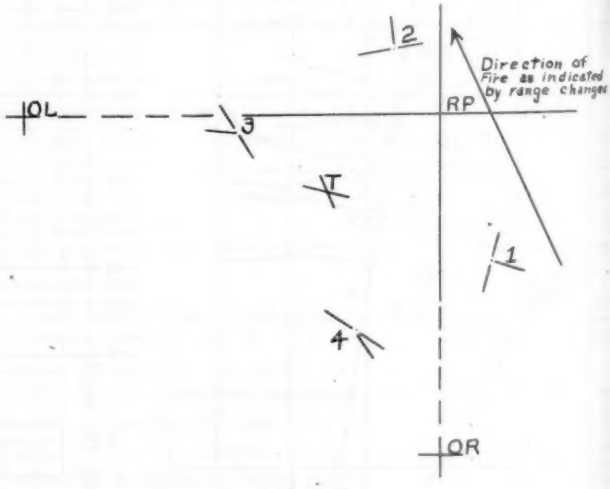


Figure 1

ROUND NO.	COMMANDS	OBS. SENSINGS OL	OR
Target Deviations		50R	70L
1.	BDR200, 4000	75R	30R
2.	4400	40L	25L
3.	L100, 4400	10R	115L
4.	4000	128R	60L

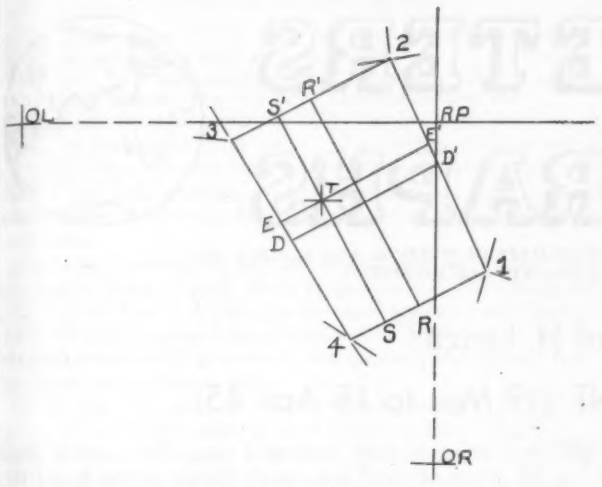


Figure 2. Solution of Graphical plot for Range and Deflection.

= ET/EE′ × deflection shift made (100′′′); shift from round No. 4.

To Solve for Range (see Fig. 2):

1. Construct lines 2-3, 1-4.
2. Bisect these lines and connect center points R-R′.
3. Construct line S-S′ parallel to R-R′ through the target.
4. Range change required to place fire on target = ST/SS′ × range change made (400 yds.); change from round No. 4.

Example

Measurements: ET = 285, EE′ = 1075.

Deflection shift from round No. 4 = 285/1075 × 100 = R 26.

ST = 875, SS′ = 1530.

Range change from round No. 4 = 875/1530 × 400 = 231 yds.

Center range for fire for effect = 4,230.

Target can now be fired on for effect and its location on the regular firing chart plotted, using as a basis the data just computed for the adjusting piece.

Notes

1. Bracket for range is desirable with the second round.
2. Bracket for deflection is desirable with the third round.
3. Ratios ET/EE′ or ST/SS′ can be determined by using any convenient scale.
4. It is recommended that the observed sensings be doubled when used to plot targets and index points, as some accuracy is gained thereby.

Using this method French artillery officers have obtained excellent effect on the fifth round fired, provided that only a small difference exists between the altitude of the index points and the target.

Artillery representatives from the Brazilian Army at the Field Artillery School advocate an extension of this idea by firing three rounds 500 meters apart at base deflection, another three rounds each at BDR 100 and BDL 100 at the same ranges at which the first three rounds were fired. These nine rounds are plotted.

Any target picked up by the two observers within the area 200 mils wide and 1,000 meters long can be fired on *for effect* by using the index points of the four rounds which confine the target and the method described above.

Advantages of This Method

1. Location of observers and reference point do not have to be known.
2. Speedy and easy to plot.
3. Points are definitely located due to large plotted angles of intersection.
4. Vital element of surprise in fire for effect not lost as with most other methods of adjustment, since indexing rounds do not have to be close to the target.

Disadvantages

1. Those inherent to any form of combined observation, namely: difficulty of observer agreement on target identification, difficulties of choosing the same adjusting point on the target.
2. Errors in observers' sensings may be magnified in plotting.
3. Appreciable difference in altitude between index points and target will introduce error unless taken into consideration upon going into fire for effect.

It is important that you *keep yourself accessible* at all times to the men of your unit. Give thoughtful consideration to complaints. The man who makes a complaint thinks he has suffered an injustice. If he has, the fault should be remedied; if not, his faulty impression should be corrected at once. In this way, no real grievances or unsound complaints will be allowed to develop.

In all phases of administration, training, and operations, make every effort to *keep your men informed*. Nothing irritates American soldiers so much as to be left in the dark regarding the *reason* for things. There is much about Army life that is new to the majority of them—old customs and traditions, and strange ways of procedure for which there are good and cogent reasons. Don't "talk down" to them, but explain in terms and illustrations with which they are familiar. Make them feel that the work in which they are engaged is important by showing them the relation between it and the large picture of the national effort. This can be done by giving short talks from time to time on material gleaned from civilian publications as well as from special material furnished by higher headquarters.

Sound psychology and long experience indicate that *the American soldier responds best to leadership which appeals to his pride* in himself and his organization. You must make every effort to build up his self-respect by laying emphasis on the proud traditions of the soldier in general and of your organization in particular. Insist on smart outward bearing, neatness in dress, and physical fitness—they are the prime indices of a good outfit. Don't forget that the responsibility is yours to set the example. If your men are to compete in a drill or athletic contest, do everything in your power to insure that the unit makes a good showing. Set high standards in the performance of all duties, and insist on their attainment. Your men must be convinced that their outfit is the best in the regiment, and that the responsibility for its good name rests on every member of it.—*FM 21-50.*

PERIMETERS in PARAGRAPHS

(BASED UPON LATEST INFORMATION AVAILABLE AT DATE OF WRITING, AND SUBJECT TO CORRECTION AS MORE COMPLETE REPORTS ARE RECEIVED.)

By Col. Conrad H. Lanza

THE WEST GERMAN FRONT (19 Mar to 18 Apr 45)

Three Allied Army Groups (General of the Army Dwight D. Eisenhower, Supreme Commander) were at the beginning of the period preparing for an invasion of Germany beyond the Rhine. These were:

21st Army Group (Field Marshal Sir Bernard L. Montgomery) on the left: Canadian First Army (Gen. H. D. G. Crerar), British Second Army (Gen. Sir Miles C. Dempsey), U. S. Ninth Army (Lt. Gen. William H. Simpson).

12th Army Group (Gen. Omar N. Bradley) in the center: U. S. First Army (Lt. Gen. Courtney H. Hodges), U. S. Third Army (Lt. Gen. George S. Patton, Jr.).

6th Army Group (Gen. Jacob Devers) on the right: U. S. Seventh Army (Lt. Gen. Alexander Patch), French First Army (Maj. Gen. Jean de Lattre de Tassigny).

The 21st Army Group occupied a line practically along the left bank of the Rhine, from the sea to north of Cologne. It had recently driven the enemy across the Rhine from the area between Nijmegen and Cologne and was reorganizing.

The 12th Army Group had accidentally captured a bridge across the Rhine at Remagen on 7 Mar. Taking full advantage of this lucky circumstance a bridgehead had been promptly established on the east side of the Rhine, and gradually expanded in hard fighting. This sector was very active, and included operations to aid the 6th Army Group.

The 6th Army Group had been engaged since 13 Mar in attacking north and northeast from Alsace with a view of clearing the enemy west of the Rhine, and in the triangle between the Mosel River—north border of Alsace—Rhine. The Third Army (from the 12th Army Group) was aiding this movement by attacking south across the Mosel. On 19 Mar the Third Army had bridgeheads over the Mosel; the Seventh Army was on the line

Saar River—Saarbruecken (G)—Zweibruecken (G)—Walshbronn (G)—Ludwigswinkel (A)—Sulz (A)—Hatten (A)—Beinheim (A).

The right of the 6th Army Group was on the Rhine southward to the Swiss border; it was tranquil except for minor patrol and artillery activity.

All three Army Groups were preparing to cross the Rhine throughout its length and advance eastward. Spring had arrived, and with it good weather could be generally expected. This permitted full use of the Air Force, in which arm the Allies were enormously superior.

The Palatinate Campaign

The enemy was withdrawing from the triangle between the Mosel and Rhine Rivers to across the Rhine. The U. S. Third Army was attacking across the Mosel and the Seventh Army from Alsace, while the Air Force attacked the rear elements of the retreating forces and endeavored to prevent the escape of the German forces which it was hoped could be enveloped.

The left of the Third Army, with 4th and 11th Armd Divs leading, had reached the Nahe River from Kirn to its mouth at Bingen. The right with the 26th and 80th Inf and 10th Armd Divs had advanced from the vicinity of Trier to the upper Nahe between St. Wendel and Birkenfeld. The center was back on the Mosel. On 19 Mar the left wing attacked across the Nahe and drove a wedge about 5 miles deep along the road from Bingen to Worms. Elsewhere the Nahe was crossed and slight gains made, when the armor went ahead to reach Merzweiler. Here it met the armor from the right wing coming from the Birkenfeld area. This junction closed across the center of the Third Army's front. It was hoped that numerous Germans would be found cut off, but it appears they had already withdrawn, except for patrols. On the south the Seventh Army attacked all along the line from Saarbruecken to the Rhine. It was in direct contact with the West Wall; fighting was very severe. Troops in line from west to east were the 45th, 71st, 42nd, 103d, and 36th Inf Divs, with French divisions near the Rhine. The 14th Armd Div operated near Wissembourg. The West Wall was pierced at a number of places, and the Germans were forced out of their last footholds on the soil of French Alsace.

On the 20th the Third Army's left made a considerable advance and captured Worms. It closed in on Mainz, but that place was defended and not entered. Armor from the left wing bypassed Kaiserslautern and contacted armor from the right wing 12 miles to the west. Infantry in trucks following the armor captured Kaiserslautern with the help of some armored detachments. The Seventh Army made its greatest advance with its left, which captured Saarbruecken and Zweibruecken. Its right met strong opposition from hostile forces endeavoring to keep open a route for their troops to the west; only slight advances were secured.

Great gains were made by the Third Army on the 21st. Along the Rhine armor reached Ludwigshafen, but fighting continued there, as it did also at Worms and Mainz further back. Bingen, which had been previously entered, was cleared. An armored detachment reached Neustadt, an important road junction threatening enemy withdrawal from points west. However, the general front of the Third Army was near the line St. Wendel—Kaiserslautern—Mainz. The Seventh Army's left reached Homburg, but its center and right against stiff opposition gained only a few miles.

The Germans were withdrawing as rapidly as possible. On account of air attacks they were forced to move in small detachments, and over secondary roads as much as possible. The retreat across the Rhine was directed to the sector between Ludwigshafen on the north, partly held by the enemy and Woerth* on the south. This was a 31-mile-wide bridgehead. On the 22nd, the Third Army advanced its lines, making its major gains at the west end. At the east end sharp resistance was met; armored spearheads striking from the vicinity of Neustadt toward Speyer and Landau were stopped by hostile artillery which caused a German-claimed loss of 29 armored vehicles. The Seventh Army moved its left forward into Zweibruecken and Pirmasens, but its right made only small gains in hard combats, which were against the enemy's West Wall.

Moving rapidly, by the following day the Germans held only a 10-mile-deep bridgehead about Germersheim, both Speyer and Landau passing to Allied possession. The enemy counterattacked near Woerth, to gain time to withdraw his troops without interference from the south. At this time the West Wall was of major use to the Germans. It was studded with numerous small concealed fortifications, each of which had to be located and then overcome by a separate operation.

By the 24th the German bridgehead was further reduced, and by the 25th had disappeared. At this date the street and house battles at the Rhine cities had ended and the entire west bank of the Rhine was in Allied possession. In this short campaign numerous prisoners had been taken, but no major German units had been cut off.

*The Woerth here referred to is the German Woerth, in Saar Province. The French Woerth is 22 miles to the southwest, in Alsace.

End of the Remagen Battle

On 19 Mar the U. S. First Army had gained a bridgehead some 15 miles wide and 8 miles deep, about on the line **Dollendorf (A)—Bruengsberg (G)—Windlagen (G)—Lorscheid (A)—Niederhoppen (?)—Hill 329 (A)—Hoenningen (A).** Fighting was heavy all along the front, but the main effort was to extend the bridgehead to the north. The advance was aided by artillery fire from the west bank of the Rhine, which enfiladed the enemy's defensive positions. The battle near the river centered around Koenigswinter, but there was an advance inland, Windlagen being taken.

The battle continued throughout the following day. The American attacks failed to make much progress inland, but considerable gains were made at both ends—at the north against strong resistance and at the south against lesser resistance. At the end of the day the bridgehead was over 22 miles wide, with the north end opposite Bonn. The depth remained at 8 miles.

On 21 Mar the trend of the battle remained as before. The advance north along the Rhine gained nearly 3 miles, reaching the Sieg River. Preliminary efforts to cross the river did not succeed. Attacks to the east met very strong hostile artillery fire and made no substantial progress. The day's fighting widened the bridgehead to 25 miles, but its depth again stayed at 8 miles.

Without a pause, the battle continued. Efforts on the 22nd to advance north across the lower Sieg failed but against heavy resistance the line was pushed inland at the northeast corner of the bridgehead to near Hennef. The south end of the bridgehead was advanced down the Rhine to include Neuwied.

The Advance into Germany

All Army Groups participated in this campaign, intended to be a blow which would cause the German armies to disintegrate and to end the war. At date of writing there is lack of information as to whether the campaign of the Allies on the west was coordinated with that of the Russians on the east. Events indicate that the west and east fronts each fought its own battles in its respective ways, and according to somewhat different strategical ideas.

On the west, the Germans held a solid line along the Rhine from the Swiss border to the sea. This was a 450-mile line, and was believed to be defended by less than 70 weak divisions—which including usual corps and army troops might be one million strong. Against this the Allied strength, as revealed by the Supreme Command, was 75 divisions, all at full strength and with complete equipment. The divisions included 16 armored and 5 airborne divisions and 54½ infantry divisions. Large replacements were available to maintain units at full strength, regardless of battle losses.

The plan of attack was to confine the assault to that part of the front between Nijmegen on the north and Karlsruhe on the south, thereby excluding the extreme ends. At the north this avoided operations in the difficult Rhine estuary, and in the south a direct attack against the West Wall and the Black Forest just back of it. The front of attack became about 255 miles.

The 21st Army Group had a 95-mile front. It was charged with crossing the Rhine between Nijmegen and Cologne and advancing northeast through the flat, open plains of north Germany, clearing the seacoast. This movement should incidentally cause the enemy to evacuate north Holland. The south boundary of the zone of operations was Cologne (exc)—Hanover (exc); this boundary was later moved northward.

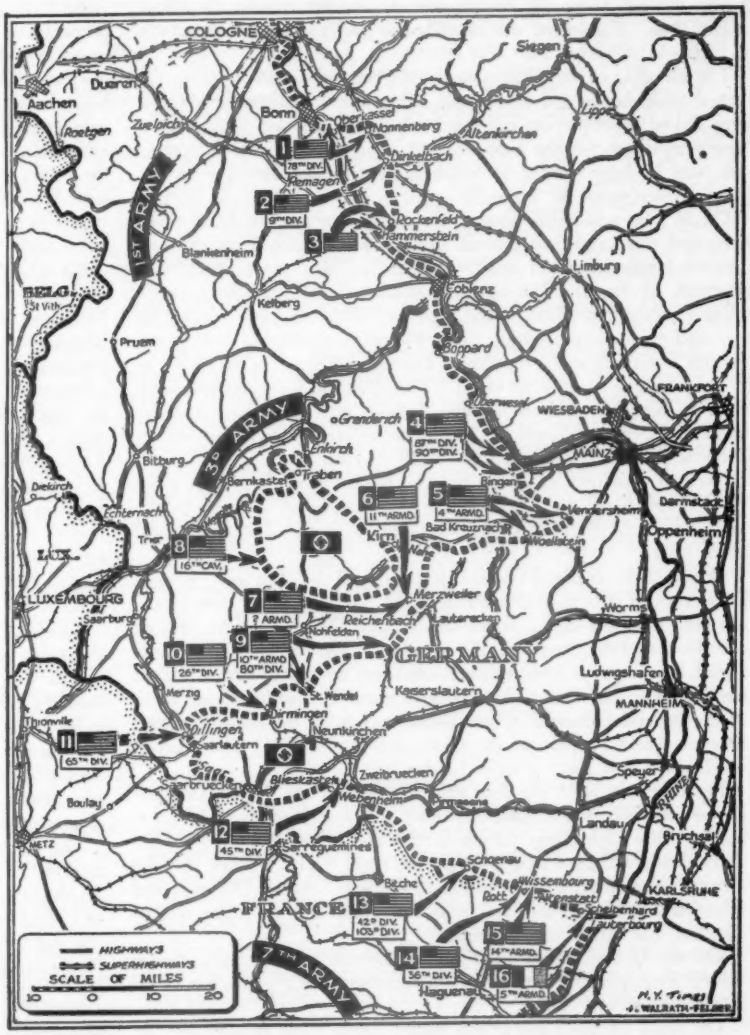
The 12th Army Group had a 110-mile front from Cologne (inc) to the Neckar River. Its direction of advance was northeast, and its south boundary the line Neckar River—Bayreuth (inc).

The 6th Army Group had a 50-mile front as far south as Karlsruhe, in which to attack eastward. The right of this Group was to hold the Alsace frontier along the Rhine.

Initial Operations

On 23 Mar the 21st Army Group fired an extremely strong artillery preparation during the day, and at 2100 hours crossed the Rhine between Rees and Wesel on a 15-mile front. The enemy had observed the preparations for this attack, in the assembling of troops and equipment. Electing not to defend the river bank, he withdrew about 5 miles inland. Allied troops were ferried over the Rhine by naval detachments (both British and American) who had brought overland the small types of landing craft suitable for crossing a river not over a mile wide but with a fairly rapid current.

During the ensuing morning airborne troops were dropped, commencing at 1000 hours, in rear of enemy lines opposite the crossing



As this period opened, in the Remagen bridgehead our forces drove northward to Oberkassel and Nonnenberg (1), at the edge of the Ruhr plain, eastward into Dinkelbach (2), and southward into Hammerstein and Rockenfeld (3). To the south the Third and Seventh Armies were carving up German forces in the Moselle—Saar—Rhine triangle. A 30-mile stretch of the Rhine bank south of Coblenz was cleared, as was the town of Bingen (4). South of Mainz our tanks, sweeping toward the Rhine, entered Vendersheim and Woellstein (5). A trap was closed on possibly 2,000 Germans by a junction of two armored divisions (6 and 7) near Merzweiler and motorized cavalry pressed in from the west (8). American armor also reached points 14 miles northwest of Kaiserslautern and joined in a thrust into St. Wendel (9). Just to the south Dirmingen was entered (10). Dillingen (11), near Saarlautern, fell. Seventh Army forces, pressing northward toward the Third Army, battled their way into Blieskestel and Webenheim (12), took Schoenau (13), cleared Rott (14), and reached the outskirts of Wissembourg and Altenstatt (15). French contingents reached the border west of Karlsruhe (16).

and to its left. More than 3,000 planes and gliders were used, indicating that 15,000 or more troops (Br 6th and US 17th Airborne Divs) were dropped. These troops succeeded in capturing intact several bridges over the Ijssel River. They were able during the day to establish contact with the troops from the Rhine front, who extended their bridgehead to a depth of about 5 miles. Fighting, which had not been overly severe, increased in intensity as enemy reserves closed in. The weather was good; full air cover and support was available. The Germans only claimed the destruction of 50 gliders and troop-laden planes. Assuming this as correct, it is materially less than 2% of the total planes used—a lesser loss than might have been expected from accidents caused by a night landing. The air landing was protected by an all-around concentrated air preparation, maintained until the dropped troops were ready to take care of themselves. The right of the bridgehead was held by the 30th and 79th Inf Divs of the U. S. Ninth Army; the remainder of the bridgehead was under the British Second Army. A British armored division crossed the Rhine in Buffaloes. The enemy was identified as the 7th and 8th Parachute and 84th Inf Divs on a 30-mile front.

The morning of the 25th opened with the British holding two detached bridgeheads and the Ninth Army one. During the day all were linked together into one solid sector 25 miles long and with a maximum depth (in the Lippe valley) of 7 miles. Severest opposition was in front of the British-held center and left, less in the Ninth Army sector on the right.

On 26 Mar additional troops were dropped in rear of the German lines, and the attack was pushed. In general it reached the railroad between Emmerich (exc) and Wesel (inc), and in places to beyond. Attempts to cross the Rhine further south failed. The Ninth Army made a substantial advance, the 79th and 30th Inf Divs gaining up to 2 and 4 miles, respectively. The Germans reinforced their front; the 6th Paratroop and 15th Panzer Grenadier Divs were identified as in line, making 5 divisions in all. The Allies had 3 American divisions on the right and an airborne division with the British and the latter had two corps over the river with at least 4 divisions and an airborne division, making a total of 10 divisions.

German resistance showed a marked decline next day. The right of the bridgehead was expanded to the vicinity of Dorsten to the east and to the Ruhr superhighway parallel to the Ruhr River and north of it.

On the 28th, armored divisions leap-frogged the 30th and 79th Inf Divs and ran into the 116th Panzer Div. There was no tank battle. On both sides the tanks sought shelter, and the engagement became one between two groups of SP batteries. The British 6th Guards Armd Div, equipped with flame throwers, advanced into Dorsten; the American 2nd Armd Div advanced about 2 miles to a ridge south of but beyond Dorsten. Other British troops on the north bypassed Dorsten (held by part of the German 84th Inf Div) and reached the Lippe Canal about 3 miles further east.

Fighting advanced the line only slightly on the 29th. Greatest enemy resistance was around Emmerich. Due apparently to advances made by the 12th Army Group further south [see below], the Germans slowly withdrew troops during the night. This enabled the 21st Army Group to advance its center to halfway between Duelmen and Muenster, while the left was near Stadtlohn and the right cleared Dorsten and advanced southeast.

On the 31st an attack on the new German position succeeded in taking Stadtlohn. An attack toward Muenster made gains, but failed to reach that city.

On April 1st the right of the Ninth Army (2nd Armd Div) bypassed Muenster on the south and reached Lippstadt. Here it met First Army troops (12th Army Group), which had come around the south and up the east side of the Ruhr area. This resulted in a circle's being drawn around the Ruhr. At this date it was not complete as the armored troops were in hostile country which had not been solidly occupied behind them. In that rear area troops from both sides were mixed. The infantry divisions of the Ninth Army faced south and became engaged in a severe battle near Recklinhausen. British troops reached Muenster but did not capture it.

Next day the British left made material gains, the Army Group reaching in general the line Zutphen (exc)—Rheine (exc)—Tecklenburg (inc)—Muenster (?)—Lippstadt. The right was parallel to and north of the Ruhr River.

On 3 Apr the left of the attack area was extended to below Nijmegen, and not meeting much opposition the line was advanced to Ijssel River and the Twente Canal, on which Lochem was captured. The British Guards Armd Div striking due north reached Nordhorn while the British 11th Armd Div arrived at Osnabrueck. In rear of the latter were the British 6th and U. S. 17th Airborne Divisions at Muenster, which was cleared. Major enemy forces had disappeared, and the enemy's defense was limited to isolated actions of a delaying nature. The U. S. Ninth Army, headed by the 2nd Armd Div, advanced to 12 miles west of Bielefeld. Hard fighting occurred on the north side of the Ruhr.

In view of the Ruhr situation the Supreme Command transferred the Ninth Army from the 21st to the 12th Army Group. The new boundary between the two Groups was approximately Muenster—Hanover.

While the foregoing operations were in progress, the 12th Army Group had under way a separate offensive.

At 2200 hours on the night 22/23 Mar, without air or artillery preparation, troops from the Third Army quietly crossed the Rhine near Oppenheim. Their bridgehead was expanded during the ensuing day. The First Army, always fighting vigorously at the Remagen bridgehead, captured Hennef and gained generally toward the east, increasing the bridgehead depth to 10 miles. The Germans counter-attacked savagely around Honnef on the following day, but while the bridgehead failed to advance inland its ends were pushed out to a total front of 33 miles. The Oppenheim bridgehead, meeting only scattered resistance at the end of the day, was 4½ miles wide and 4 miles deep.

On 25 Mar a massive offensive was opened with three principal operations. Before dawn the First Army attacked (with the 1st, 9th, 78th, and 99th Inf Divs) eastward from the Remagen bridgehead. The artillery preparation started at 0400 hours. At 0600 armor leap-frogged the infantry divisions and led them to the assault. The advance was not very rapid. The enemy had foreseen the attack, destroyed all bridges, felled numerous large trees across roads, and thickly mined areas likely to be passed over by armored vehicles. Rocket planes worked with the armor, which met strong opposition on the left, moderate on the right. Notwithstanding the difficult conditions, the armor broke through the enemy's lines and by night leading elements were at Flammersfeld. The left of the attack was along the Sieg River, on which attacks failed. The enemy attacked first in this area, against the U. S. 1st Div, which repulsed him and made a net gain of 1½ miles for the day.

South of Coblenz an entirely new attack was made, troops crossing the Rhine in assault boats against strong resistance.

The Third Army had the greatest success of the day. It attacked outward from its bridgehead opposite Oppenheim, and met surprisingly little resistance. The 4th Armd Div broke through and by 1800 hours had traveled over 30 miles to the vicinity of Hanau and Aschaffenburg. The 5th and 90th Inf Divs, following, reached respectively the vicinity of Frankfurt (on-the-Main) and Darmstadt. The latter large city made no resistance.

On 26 Mar the First and Third Armies attacked vigorously to exploit the gains made the previous day. Resistance was strong only on the left of the Army Group. The 1st Inf Div reached the Sieg at Eidorf but was unable to cross that stream. The 99th Inf Div on the right advanced 22 miles to Limburg. The center of the First Army reached Altenkirchen with infantry, with armor 10 or more miles forward.

The Third Army's left, which had crossed the Rhine below Coblenz, advanced toward Frankfurt, which was entered from the south by the 5th Inf Div who started a street and house battle. The 4th Armd Div had detachments out 15 miles beyond the Main at Aschaffenburg, which town remained in enemy possession.

Enemy opposition was about the same next day. It was strong along the Sieg River, and no advance was made in that direction. The First Army's center against minor opposition reached the line Herborn (inc)—Wetzlar (exc)—Wiesbaden (exc). The Third Army's armored reconnaissance detachments were east of Gemuenden. The enemy held Hanau and Aschaffenburg.

On 28 Mar the 12th Army Group concentrated on uniting the various bridgeheads. The First Army advanced only about 6 miles eastward to Giessen, but made considerable progress to the south. Third Army troops arrived north of Wiesbaden in liaison with the First Army. The enemy was defending Frankfurt, and the 6th Armd Div entered the battle at that place. Infantry attacked and

entered Hanau and Aschaffenburg, covered by the 4th Armd Div east of Gemuenden. The First Army's armor, finding only small enemy detachments, covered its infantry by a line through Frankenberg.

On the 29th advance armored elements continued their advance, the direction of the Army Group being northeast. The 3d Armd Div covered the left of the First Army, reaching Brillon; the 9th Armd Div was to the south near Marburg. The Third Army's 4th Armd Div moved to the vicinity of Lauterbach, while the 6th Armd Div pulled out of the continuing battle in Frankfurt to near Bad Nauheim. The 5th Inf Div completed the Frankfurt battle. The 45th Inf Div arrived south of Aschaffenburg, while the 3d Inf Div commenced operations to clear the hills south of Darmstadt. The 6th Army Group entered the operation, elements of the U. S. Seventh Army occupying Mannheim and crossing the Neckar, facing south near Heidelberg.

On 30 Mar the 3d Armd Div reached the edge of Paderborn and the 9th occupied Fritzlar. The 6th Armd Div approached Fulda while the 4th was covering the Kinzig valley northeast of Hanau. A considerable hostile force was south of Aschaffenburg, on the east side of the Main; a severe battle was in progress, with American divisions holding a bridgehead not over 3 miles deep.

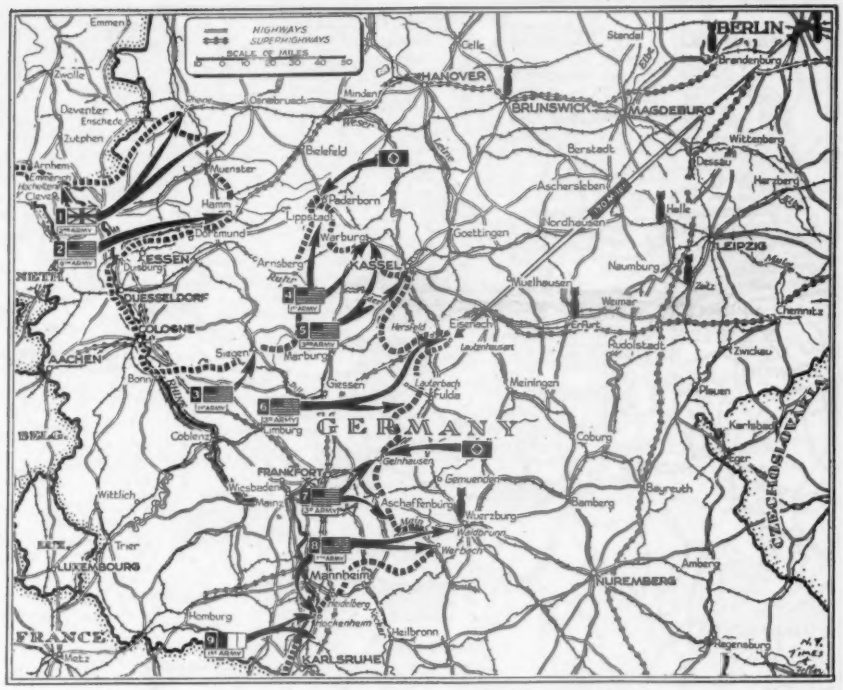
Next day the enemy defended Paderborn with dug-in tanks and infantry. American infantry, following, reached Brilon. The 9th Armd Div closed on Kassel, with the 6th Armd Div just south. The 4th Armd Div arrived near Hersfeld. The left of the First Army was having a hard fight along the Sieg River, where the enemy was defending the south border of the Ruhr River. The right of the Third Army was having an equally hard battle at and south of Aschaffenburg. The center of the Army Group did not meet important enemy forces. The 6th Army Group's Seventh Army advanced south from Heidelberg; its French First Army made a new crossing of the Rhine on a 9-mile front south of Speyer.

On 1 Apr the 2nd Armd Div from the Ninth Army, coming south, met the 3d Armd Div, which had come north near Lippstadt, thereby establishing a light ring around the Ruhr. The 9th Armd Div moved north to the Warburg area. The Third Army's 6th Armd Div advanced into the hills south of Kassel; the 4th arrived west of Eisenach, and the 11th Armd Div came up on its right northeast of Fulda. The 90th Inf Div arrived at Hersfeld, mopping in close support of the armor. In the 6th Army Group the 12th Armd Div advanced south to the vicinity of Bad Mergentheim while infantry held the line east from Hockenheim to Mosbach and Wuerzburg (exc).

Aschaffenburg had unexpectedly developed into a serious street and house battle, which had already continued for several days with increasing ferocity. The enemy consisted of about two battalions of infantry. The commander had armed a large number of civilians, including some women and children, and the combined force was making a fanatical stand against the 45th Inf Div. Regular German troops held the Main River line to the south.

By evening of 2 Apr the First Army's armor was still near Paderborn and Warburg. The Third Army's armor had advanced to halfway between Kassel and Eisenach (6th), just beyond Eisenach (4th), and just north from Meiningen (11th). In close support the 80th and 26th Inf Divs were at Kassel and Fulda, mopping minor enemy detachments. The Seventh Army closed around Wuerzburg and reached Ochsenfurt to the south.

Next day the Aschaffenburg garrison surrendered and thereby cleared what had been a serious road block. In Kassel a battle was still on; at Warburg it ended. Infantry had closed in and had isolated the Ruhr. The Seventh Army attacked Wuerzburg, infantry crossing the Main River in assault boats under cover of strong air and artillery fire. Other troops approached Heilbronn.



By the end of March, as the Canadians fought to Hochelten, British armor was believed to have reached the Rheine area and to be northeast of Muenster (1), while the American Ninth Army had sped to the vicinity of Hamm (2). The Germans fought hard for Paderborn (4) to keep the First Army from joining the Ninth and closing the escape gap from the Ruhr. To the southwest infantry took Siegen (3). The First and Third Armies made contact at Warburg (4) and the Third was only five miles south of Kassel (5). It won Lautenhausen and was seven miles from Fulda (6). It also was counterattacked at Gelnhausen but gained five miles southeast of Aschaffenburg (7). The Seventh Army crossed the Tauber and raced to Waldbrunn, six miles from Wuerzburg, and Werbach (8). It linked up at Hockenheim with the French First Army, which crossed the Rhine on a 10-mile front between Mannheim and Karlsruhe (9). Bomb devices indicate targets that were heavily pounded, most of which are important railway centers.

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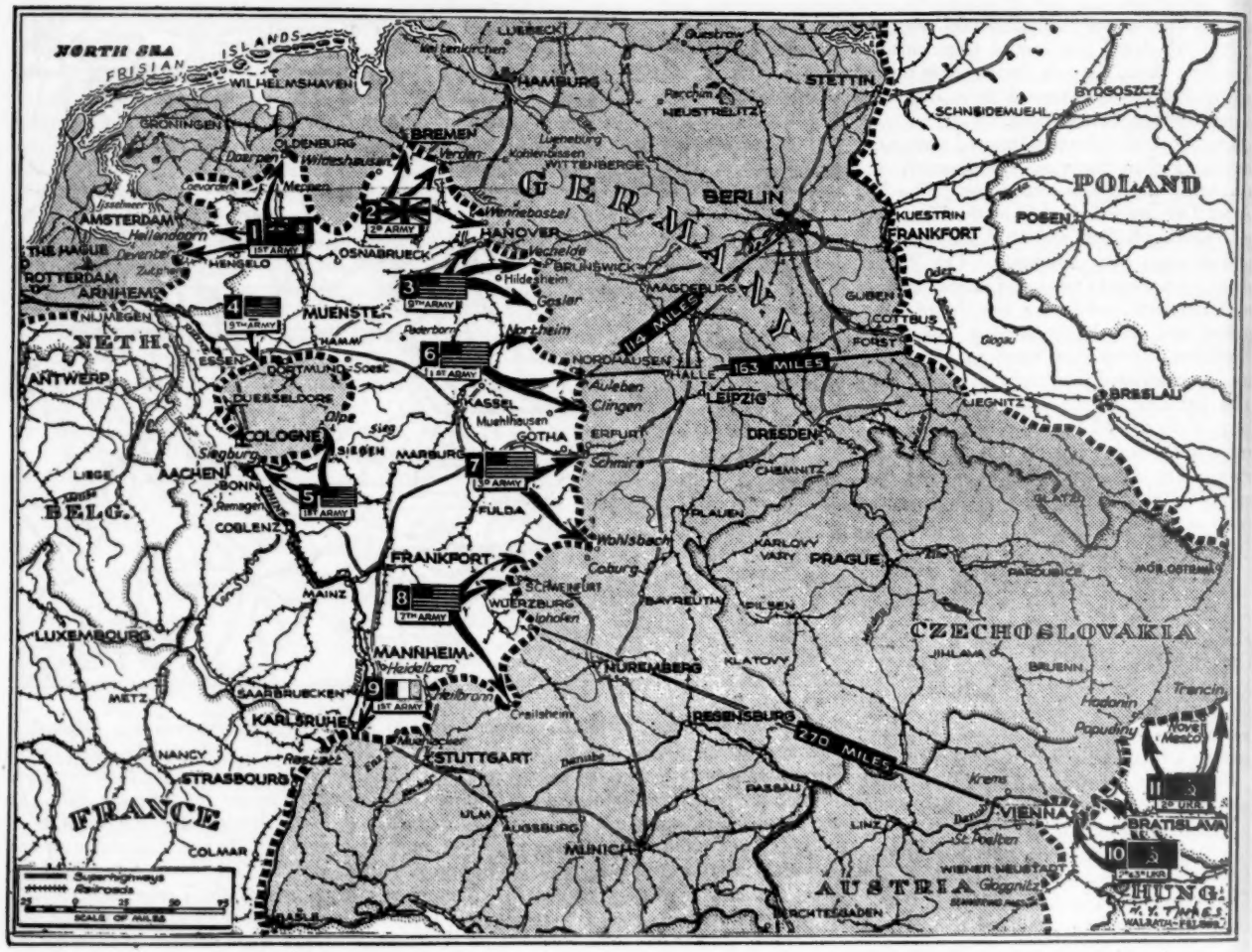
After 3 April the operations divided into several sectors, which will be considered separately. The 21st Army Group was charged with advancing through the flat country of north Germany, clearing the coast. According to an agreement reached at Yalta in February by the leaders of the three main Powers, the northwest part of Germany was to be eventually garrisoned by British forces. The 12th Army Group was charged with advancing northeast into the heart of Germany toward Berlin and Dresden. The 6th Army Group covered the right of this movement from the south and southeast. A detached operation (assigned to the 12th Army Group) was the reduction of the Ruhr, now in the rear areas of the Allied armies.

Operations of the 21st Army Group from 4 to 18 Apr

On the 4th the Canadian First Army on the left attacked from the Nijmegen bridgehead in Holland, and generally reached the Neder Rijn with its right across that river near Zevenaar. The British Second Army's armor advanced through Hengelo to the Ems River near Lingen. A street and house battle was in progress in Osnabrueck and another was ended in Muenster.

The advance continued next day. The Canadian right advanced from Hengelo to Almelo. British armor reached the line Diepholz (inc)—Minden (exc) against minor opposition. Osnabrueck was cleared and infantry moved forward. On the 6th, the Guards Armd Div arrived near Meppen on the Ems River, the 7th advanced toward Berlin, and the 11th Armd Div headed eastward across the Weser north of Minden. Infantry was close behind, mopping. The Cana-



By 10 Apr Canadian troops (1) entered Deventer, overran Hellendoorn, and reached Doerpen, 15 miles from the North Sea. The British (2) moved to the outskirts of Bremen, were said by the enemy to have taken Verden and seized Wennebostel. Hanover fell to the American Ninth Army (3), which also took Vechelde and forced its way into Goslar. Attacking the Ruhr pocket, the Ninth advanced southeast of Essen (4) and the First captured Olpe and Siegburg (5). Other First Army units (6) took Northeim, drove through Nordhausen to Auleben, and reached Clingen. The Third Army (7) entered Schmira and Wohlsbach. The Seventh (8) tightened its arc around Schweinfurt and broadened its Crailsheim spearhead. French troops pushing toward Rastatt (9) met stiff resistance. The Russians cleared more of Vienna (10) and captured Popudiny and Trencin (11).

dian 3d Armd Div advanced beyond Almelo; their 4th Armd Div was west of Meppen.

On 7 Apr considerable enemy resistance was encountered. A Canadian attack on Zutphen, although preceded by a strong artillery preparation, failed to capture that place. The left of the British Army entered Meppen and advanced beyond Lingen. Its greatest advance was by the 7th Armd Div, which followed down the west side of the Weser River to some 10 miles from Bremen. The British 11th Armd Div, with the 6th Airborne Div following closely, having passed north of Minden, crossed the Weser River and arrived near Wunstorf, 12 miles from Hanover.

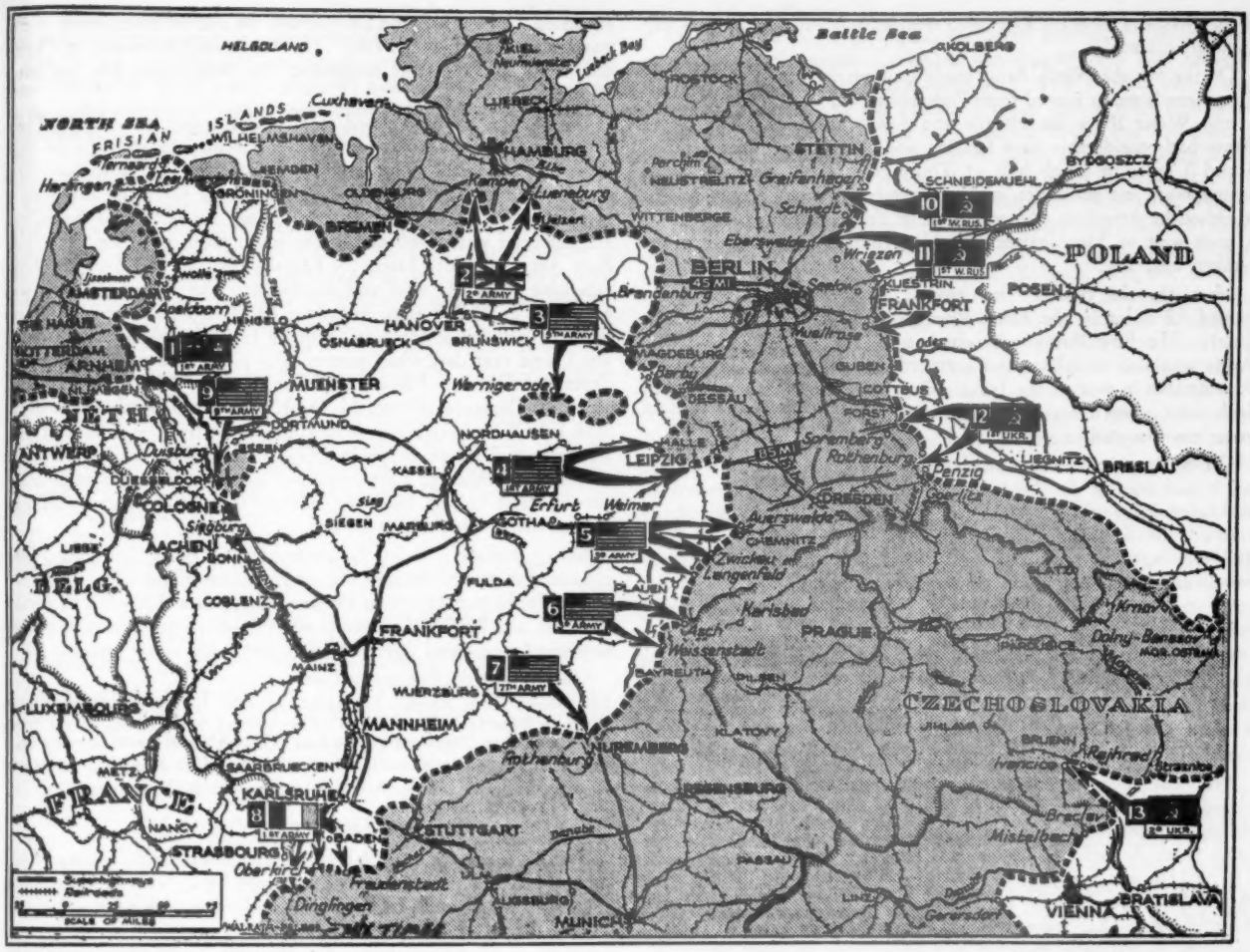
During the night 7/8 Apr Airborne troops were dropped in north Holland to aid the advance of the Canadian First Army. Very little information has been given out about this. The enemy claims it was a complete fizzle. The Canadians attacked strongly. In hard combats Zutphen was captured by the 3d Armd Div, while the 4th Armd Div had elements arrive near Meppel. The British 7th Armd Div was unable alone to seize Bremen, so assembled in the area about Syke. The 11th Armd Div with supporting troops assembled along the Leine River, northwest of Hanover.

On 9 Apr the Canadian Army did not report any advance, and no mention was made as to the fate of the airborne troops which had been dropped in north Holland. The left of the British Second Army met considerable resistance but advanced to the vicinity of Fuerstenau, while the center (7th Armd Div) hovered outside of Bremen. The right, led by the British 11th Armd and 6th Airborne Divs, crossed over the Aller River near Walsrode. The advance toward Hanover was discontinued, being assigned to the 12th Army Group.

The Canadians met very heavy opposition next day but advanced to Deventer. The left of the British Second Army arrived on the line Soegel—Haseluenne. The British 7th Armd Div crossed the Weser at Hoya and joined the 6th Airborne Div east of Nienburg. The British 11th Armd Div advanced 10 miles eastward from Neustadt. The Canadian attack was continued on the 11th, while the British left reached the line Quakenbrueck—Osnabrueck, with armor far in advance (on the Leine River).

On 12 Apr the Canadian armor had moved eastward. Their 4th Armd Div had a heavy engagement which ended an advance near Friesoythe; the 5th Armd Div was operating toward Groningen. Infantry divisions were attacking westward around Zutphen and Deventer against increasing resistance. The British left moved forward in considerable fighting to the line Haseluenne (G)—Loeningen (Br)—Lohne (Br)—Lake Duemmer. The extreme right moved to and occupied Celle on the Aller River.

Fighting generally decreased on the 13th. The Canadian left had the greatest resistance: it cleared Arnhem, and made slight advances beyond Zutphen and Deventer. The center reached Assen against lesser resistance. The British left arrived at Cloppenburg and Vechta, slowly approaching Bremen; its right crossed the Aller near Celle and advanced 10 miles to Eschede. This latter advance was



Attacking the Netherlands pocket, at the period's close, the Canadians reached the Ijsselmeer east of Amsterdam (1). Below Hamburg the British Army (2) swept into the towns of Kampen and Lueneburg. The American Ninth Army (3) captured Magdeburg and dug into the Harz Mountains pocket to take Wernigerode. The First Army battled in both Halle and Leipzig (4). Near Chemnitz the Third (5) reached Auerswalde and cleared Zwickau and Lengenfeld. The Third also bisected pre-Munich Germany when it thrust into Czechoslovakia near Asch (6). To the south it entered Weissenstadt. Nazidom's shrine of Nuremberg was invaded by the Seventh Army (7). The French (8) took Freudenstadt and Oberkirch and reached Dinglingen. In the shrunken Ruhr pocket our troops battled with Duesseldorf (9). On the eastern front the Russians, according to Berlin, were driving between Schwedt and Greifenhagen (10), between Eberswalde and Muellrose (11), and in the areas of Spremberg and Rothenburg (12). To the south Ivancice fell (13).

continued next day to Uelzen, while the Canadians in Holland reached the vicinity of Groningen.

On 15 Apr the battle north of the Rhine advanced westward against very persistent resistance. A battle in Arnhem was only ended this day. From there the line extended to Apeldoorn and Zwolle, both exclusive. In the north Groningen was reached. In the center there was heavy fighting around Friesoythe, without much change in the situation. Without much opposition the extreme right had arrived on the Elbe between Wittenberge and Tangermuende.

Heavy fighting became limited to three sectors, nearly evenly distributed between the left, center, and right. On the 16th the left met very strong resistance from the German forces defending the area of the great Dutch ports. The Canadian attack south of Ijssel Sea made only small gains. In north Holland the enemy withdrew generally, but held Groningen for a street-and-house battle to gain time. The center of the Army Group (left of the British Second Army) continued its hard fight around the Friesoythe area, again without materially changing the situation. The right which was across the Aller River extended its bridgehead from Eschede northwestwardly to include Bergen and Walsrode.

This movement from the Aller River was continued on the 17th, when the line was advanced northward toward Hamburg across the Luenenburger Moor, as far as Schneverdingen. There was a slight advance near Friesoythe. In Holland the northern area was nearly clear of Germans, but south of the Ijssel Sea the battle was severe. It resulted in the capture of Apeldoorn.

On 18 Apr the trend of the battle continued unchanged. Slight gains in heavy fighting were made south of the Ijssel Sea, Wegeningen and Ede being taken. The advance over the Luenenburger Moor continued. At this date the line for the 12th Army Group was **Wall River from the sea to Wageningen (A)—Barneveld (?)—Harderwijk (A)—Zwolle (A)—seacoast (less islands offshore) to vicinity Groningen (A)—Winschoten (A)—Papenburg (?)—Friesoythe (Allied bridgehead across the canal just to north)—Wildeshausen (A)—Delmenhorst (G)—Syke (A)—Verden (A)—Walsrode (A)—Neuenkirchen (G)—Buchholz (G)—Amelinghausen (G)—Uelzen (?)—Luechow (G)—Wittenberge (G)—Elbe River to connection with U. S. troops near Tangermuende.**

12th Army Group from 4 to 18 Apr (Less Ruhr Campaign)

On the 4th the Ninth Army's armor (in order from north to south: 5th, 2nd, and 8th Armd Divs) reached the line Bad Oeynhausen—Lemgo—Driburg. The First Army's was near Warburg. The Third Army's armored divisions (in same order: 6th, 4th, and 11th) were respectively west of Muelhausen, southwest of Gotha, and around Suhl. The 80th Inf Div cleared Kassel. Average advance on this day was about 4 miles, enemy resistance increasing.

On 5 Apr the Ninth Army's armored front ran through Rinteln (5th) and Hameln (2nd). The 30th Inf Div, following, was at Detmold. The Third Army's armored front advanced through Muehlhausen to Schlotheim (6th), southeast of Gotha (4th), and Arnstadt (11th). These divisions were respectively followed by the

65th, 89th, and 90th Inf Divs who mopped rear areas which this day included Eisenach.

On the 6th the Ninth Army made no material advance, while the First Army's armor moved from Paderborn (3d) and Warburg (9th) to the Weser River for 20-mile and 8-mile advances. The Third Army had considerable hard fighting and advanced its lines between 4 and 5 miles in rough hills of Thuringia. The enemy organized strongpoints and ambushes, and by a number of small actions sought to delay the American advance. One of these isolated actions retook a town west of Muehlhausen, blocking communication until it was retaken next day.

Next day the Ninth Army crossed the Weser, and the armor gained 12 miles to the Leine River from Hanover (exc) to Elze (inc). The First Army was refueling on the Weser. The Third Army was also refueling, and occupied the day in reducing enemy detachments in rear of the front. Over an extensive area troops of both sides were intermingled, leading to numerous combats which arose anytime and anywhere.

On 8 Apr the Ninth Army's armor bypassed Hanover on the south and reached the Innerste River. The First Army arrived on the Leine River with its right near Goettingen. The Third Army reached the line Dingelstadt—Muehlhausen—Gotha—Schleusingen (all inc) against much confused opposition. As there are many woods and towns in this area air observation could not always discover enemy positions, many of which were held only by small forces, relatively easy to conceal.

On the 9th the 2nd Armd Div crossed the Interste River at Hameln without resistance. The 5th Armd Div was south of Hanover; the 84th Inf Div just west of the city prepared to attack. The 83d Inf Div followed the 5th Armd. The First and Third Armies made slight advances against continuingly increased opposition.

Next day Hanover was taken without much opposition and troops closed on Brunswick. The First Army extended the line southward through Nordhausen; the Third extended its right to north of Coburg (11th Armd), while its center started a battle in Erfurt.

The 11th was a day of great advances. The Ninth Army's 2nd Armd Div advanced 50 air miles to reach the Elbe River near Magdeburg. That town with its bridges was held by the enemy. Infantry in rear were engaged in a heavy fight to clear Brunswick. The 6th Armd Div of the Third Army advanced 46 road miles to cross the Saale River north of Jena. In its rear a battle was on in Erfurt. Coburg, found garrisoned, was attacked. Enemy resistance was restricted to key points; the intervening country was generally clear.

On 12 Apr the Ninth Army closed on its advanced armor. The First Army gained 20 miles, its 3d and 9th Armd Divs reaching the line Sangershausen—Koelleda. The Third Army extended its right slightly. Next day Brunswick was cleared; the 5th Armd Div marched 50 miles to the Elbe River, north of Magdeburg. A small crossing was made in assault boats. The First and Third Armies were mostly engaged in heavy fighting against scattered enemy forces throughout their zones. An advance was made to 11 miles east of Jena, which city was still in enemy hands. Erfurt was reduced.

On 14 Apr the 2nd Armd and 30th Inf Divs had two bridgeheads across the Elbe, one south of Magdeburg and the other near Barby. During the night a bridge had been thrown to the north bridgehead. It was put out of commission by enemy artillery at a time when ground haze prevented air observation. The troops over the river were counterattacked and forced back. The south bridgehead met little opposition and was built up to a depth of 4 miles. The 5th Armd Div arrived on the Elbe in the Tangermuende area. The following infantry were 30 miles back. First Army armor arrived astride of (but excluding) Halle, that of the Third Army on the Pleisse River south of Leipzig.

The German armies were disintegrating and had no longer offensive power. Defensive resistance was limited to restricted areas, but in them counterattacks were carried out. On the 15th there was not much change in the zone of the Ninth Army. The First Army's armor made considerable gains, the 3d Armd Div reaching the Mulde River south of Dessau while the Ninth reached the same river on a 6-mile front east and southeast of Leipzig, still in enemy hands. Operations were started against a hostile group in the Harz Mountains north of Nordhausen. The Third Army's armor also advanced. The 6th Armd Div crossed the Mulde River south of the position of the 9th Armd Div. The 4th Armd Div closed on Chemnitz from the west and southwest; the 11th Armd Div captured Bayreuth.

On 16 Apr infantry closed in around the east side of the Harz Mountains, thereby isolating whatever German troops were in that rather difficult area. The armored divisions of the Third and First Armies maintained their line along the Mulde River and extended it in places. Efforts to cross the river did not succeed in the north, but a bridgehead was established in the south north of Chemnitz. The First Army started a battle for Leipzig, the 2nd and 69th Inf Divs attacking from the west and southwest. The enemy garrison was estimated as 25,000 men, including 8,000 regular troops. The remainder included children as young as 12 years. A similar situation was found next day, when numerous civilians were noted fighting in defense of Dessau. The armored line along the Mulde was extended south of Dessau to Bitterfeld (exc). Protected by the armor, the 30th Inf Div attacked Magdeburg; the 104th Inf Div continued with its street and house battle in Halle, estimated as half completed; the 2nd and 69th Inf Divs continued with the reduction of Leipzig. Southwest of Leipzig following infantry divisions advanced southeast toward the Czechoslovakia border.

On 18 Apr the 30th Inf Div, aided by part of the 2nd Armd Div, cleared that part of Magdeburg which is west of the Elbe. The 83d Inf Div enlarged slightly its bridgehead opposite Barby. The battles in Halle and Leipzig continued, with American gains in both places. Between Leipzig and Bayreuth there were only minor actions.

On this date the line reached was

Elbe River from north of Magdeburg (A) to Dessau (G)—Mulde River to Bitterfeld (G)—Halle (?)—Leipzig (?)—Mulde River from Colditz (G) to Chemnitz (G)—Aue (G)—Asch (G)—Bayreuth (A). There was an enclosed enemy pocket in the Harz Mountains between Wernegerode on the north and Nordhausen on the south.

6th Army Group from 4 to 18 Apr

The U. S. Seventh Army held the line from Aschaffenburg southwest toward Heilbronn (exc); the French First Army continued the line westward to south of Karlsruhe, and on the 4th advanced to the Neckar River. Next day the advance was continued by the French against very strong resistance. The West Wall, paralleling the Rhine, afforded the enemy numerous centers of resistance. Initial objectives were Rastatt and Pforzheim. To maintain liaison between the French moving south and the Third Army on its left going northeast, the Seventh Army had to expand its front which gradually faced southeast. On the 5th this front was extended to the Kinzig valley south of Fulda. An offensive against Wuerzburg entered that city for a new battle.

On 6 Apr a third of Heilbronn was cleared; so was nearly all of Wuerzburg, and a start had been made on Fulda. The 10th Armd Div was sent south halfway between Heilbronn and Wuerzburg and reached the vicinity of Doerzbach. This division reached Crailsheim next day after capturing several enemy supply trains. South of Fulda the front was advanced southeastwardly against spotty resistance.

On the 8th a hostile force attacked Crailsheim and forced the 10th Armd Div in part back—some were cut off near Crailsheim, other elements went six miles west. Efforts to relieve this division were immediately initiated by an advance of infantry from the vicinity of Bad Mergentheim. South of Fulda the advance reached the vicinity of Schweinfurt, found to be held by the enemy. The French entered Pforzheim; they also continued the battile in Heilbronn.

On 9 Apr strong air forces aided the French by bombing the West Wall north of Rastatt. The capture of Pforzheim was completed. A very mixed battle continued near Crailsheim between 10th Armd Div units and infantry sent to its aid, and enemy attempting to encircle American detachments.

The air attack enabled the French to make a 5-mile gain next day to approach Rastatt. The battle in Heilbronn kept going, but east thereof French troops crossed the Enz River on a 5-mile front. The Creilsheim battle kept on in a series of attacks and counterattacks. A new battle was started in Schweinfurt.

On 11 Apr detachments of the 10th Armd Div in Crailsheim had been relieved and a withdrawal was made in that area. All prisoners and supplies taken were brought off. The troops withdrawn assembled on the following day around Ochsenfurt, and from there advanced east to Marktbreit. On the next day the French captured Rastatt

and had all but finished the long battle in Heilbronn. Schweinfurt was taken after a particularly bitter fight.

On 13 Apr a bridgehead was established northeast of Heilbronn over the Neckar River, and an eastward advance was started. In an entirely new operation French troops crossed the Rhine at Strasbourg, captured Kehl, and established a bridgehead. Little resistance was met. French moved north from Kehl, while others from Rastatt attacked south. The latter reached Buehl on the 14th.

On the 15th a general advance was made to the southeast. French troops occupied Offenburg in the Strasbourg bridgehead area. On the 16th the 12th Armd and the 45th Inf Divs were just northeast of Nuremberg. The city was at once entered, and a street and house battle started. At the same time an encirclement of the city was undertaken, not completed, however, until the 18th. The French Army was attacking toward Stuttgart. The direct attack south from Heilbronn did not make much progress, but to the west the French arrived at Nagold on the 17th.

On 18 Apr the French attacked east toward Stuttgart from the vicinity of Calw, and at the same time attacked the city from the north. Neither attack made any special gains. The Seventh Army was engaged in a bitter fight within Nuremberg. Elsewhere there were only minor actions.

The line reached was

Creussen, just south from Bayreuth (A)—Erlangen (A)—Nuremberg (?)—Ansbach (G)—Rothenburg (A)—Schwaebische Hall (G)—Bietigheim (A)—Pforzheim (A)—Calw (A)—Horb (A)—Freudenstadt (A)—Offenburg (A)—Rhine River to Switzerland.

Operations to Reduce the Ruhr Between 4 and 18 Apr

On the 4th the front on the south was a line along the Sieg River and through the Rothaar Hills held by the U. S. First Army, which also covered the east side of the Ruhr in conjunction with the Ninth Army along the general line Meschede—Ruethen—Soest, all enemy-held. The north side (south of the Lippe River) was held by the Ninth Army.

The first American attack was on the northeast corner. On the 5th it captured Reuthen and reached the Hamm-and-Soest RR. Along the Sieg River the enemy made a number of attacks without other result than to postpone an American advance. Next day Hamm was taken.

On the 7th the weight of the attack was around the east end. Advances were made beyond Soest and north of Dortmund. On the south attacks on Siegen failed to capture it, but an advance was made and the Sieg River was crossed just west of the city. This attack was continued next day without special gains. Some of the units were the 75th Inf, 8th Armd, and 9th, 78th, and 8th Inf Divs. Fighting was severe.

On 9 Apr the attack was extended on the north side to opposite Essen, which was entered. On the east advances were made to include Werl and Meschede; on the south Sieg was taken and passed. The main effort was now centered on cutting the Ruhr into two parts by an advance through Essen.

On the 10th this attack from the north reached the Ruhr River, while the attack against Dortmund was making only slow progress. On the east in heavy fighting advances of 1 to 2 miles were made. On the south Siegburg was taken. On the 11th a street and house battle continued in Essen, but the attacking troops had by-passed it. A similar situation arose this day at Bochum, where attacking troops passed around the city on both sides to reach the Ruhr River. The attack was further extended on the 12th, to the entire circumference of the Ruhr pocket, less the west side. Armor attacked north down the Rhine valley and reached a line opposite Cologne. Troops from the Siegen area reached the vicinity of Rosbach. On the east the line approached Arnsberg. German resistance was everywhere severe and included numerous counterattacks. On the 14th the long battle in Dortmund ended with that city completely in American possession; troops passed on and reached Hagen, just south of the Ruhr River. Advances were made on the east side.

The cutting operation was concluded on the 15th, when troops from the north and south joined near Witten. Hagen was cleared. The cutting penetration involved joint advances from the two sides of 50 miles, and had taken 8 days to accomplish.

On 16 Apr the German Lehr Panzer Division surrendered at Iserlohn. Its total strength was only about 3,000. Further west a German corps of 3 divisions having only 5,000 men in all and but 27 officers, also surrendered. These were the first formal surrenders of the campaign.

The enemy now held only the area about Dusseldorf, where a battle was continuing right along. This final center of resistance was practically overcome on the 18th when this campaign ended with the complete capture or destruction of an enemy force which proved to have been originally about 300,000 strong.

French Ports

On 15 Apr an operation was started to reduce the enemy's river block at the mouth of the Gironde River. German forces held both banks, preventing access to the port of Bordeaux. This was a coordinated air, sea, and land attack. The sea attack was mostly by French ships under American command; air forces were American and British; ground forces were French. There was an intense artillery and air preparation by all branches on the first day. Next morning, the 16th, the French attacked on the north and captured Royan. Another attack was launched on the south side. By the 18th the north attack had captured the enemy's position; the south attack had driven the enemy into his last line of defense at Cape de Grave.

Prisoners of War

Although formal surrender of German organizations has been rare the number of individuals surrendering has been enormous, and on one day surpassed 110,000 men. The total taken by the Allied armies since 6 June has amounted to just over two million. Of this number a million have been taken during March and April.

THE EAST GERMAN FRONT (19 Mar to 18 Apr 45)

The Vienna Campaign

During the period the outstanding campaign has been that of the 2nd and 3d Ukraine Army Groups from Hungary into Austria. The two Russian forces were respectively north and south of the line Gyoer—Budapest (both to 2nd Ukraine). The line was

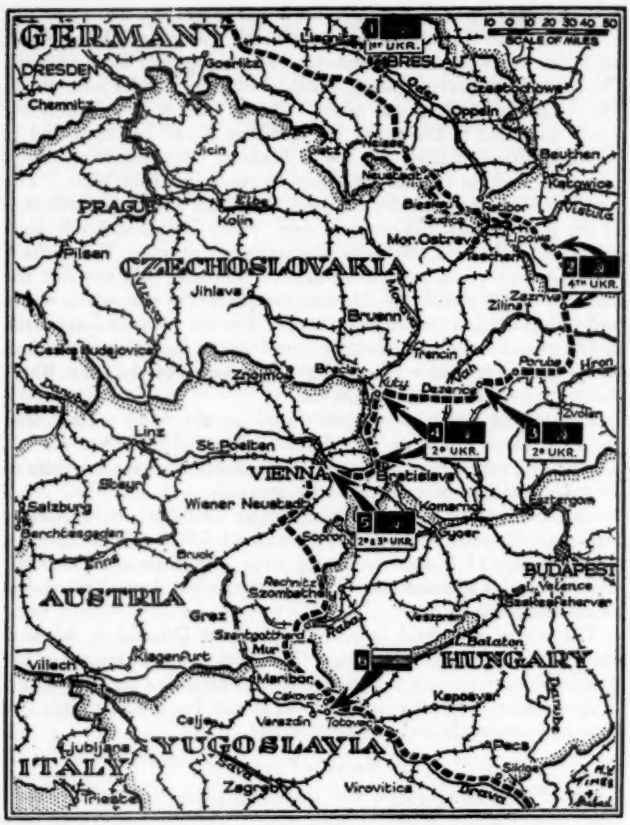
Hron River—Esztergom (?)—Felsoegalla (G)—Szekesfehervar (G)—Lake Balaton—Marcali (G)—Nagybajom (G)—Nagyarad (G)—Barcs (?)—Drava River to Donji Miholjac (G)—Nasice (G)—Brod (G)—Drina River.

During the first half of March a strong German offensive had made gains northeast of Lake Balaton. On 15 Mar the Russian 2nd Ukraine Army Group counterattacked with main effort against the line Felsoegalla—Szekesfehervar. According to German accounts the Russians had 10 infantry and an unstated number of armored divisions in line; the Russians state that the Germans had 11 divisions in line, all armored.

On 19 Mar the Russian offensive gained on the north, to reach the vicinity of Tata. German reserves stopped the movement at this point. The German High Command were not particularly alarmed; next day they staged a small offensive south of Lake Balaton. The Russians also brought forward fresh divisions and, having effected a change in the line, attacked on the 21st and 22nd. This reached a point about due south of Komarom, but part of this was lost to a Panzer attack which struck the Russian left flank.

On the 23d the 3d Ukraine staged a major attack just north of Lake Balaton and advanced to the vicinity of Zirc—Veszprem. The 2nd Ukraine extended its attack to the north side of the Danube, up its north bank. In view of the Russian success the Germans evacuated Szekesfehervar and Felsoegalla and withdrew to the Bakony Mountains. Esztergom was also given up. The Bakony Mountain positions failed to hold: Russian armor quickly pierced the German line and reached Papa by the 25th, the Germans forming a new line along the Marcal River as an advanced position, with main line along the Raba River. North of the Danube the Germans fell back to the Nitra River.

The Russians made short work of the advanced line and pierced the main line near its center (between Koermend and Sarvar) on the 29th. Armor at once dashing forward passed through Szombathely. Thence dividing, columns went west and northwest and reached the Austrian border that night. A start was made on crossing the Nitra,



Early in April Soviet troops seized three suburbs of encircled Breslau (1). In the Carpathian region Lipowa and Zazriva (2) were captured, while in Slovakia, Dezerice was won in a drive toward Trencin (3). In a sweeping advance the Russians reached the Morava between Kuty and the river's confluence with the Danube (4). Further gains were made at the edge of Vienna (5). In Yugoslavia Bulgarian forces took Totovec on the way to Varazdin (6)

one bridgehead being secured. In view of this success, indicating that the German line was generally weak, the 3d Ukraine extended its attack over the sector between Lake Balaton and the Drava and thereafter attacked everywhere with maximum vigor.

The Russian advance through Szombathely had been unexpected by the German High Command. There were no reserves immediately available to head off the Russian advance toward Wiener Neustadt. The situation was more serious as the 2nd Ukraine north of the Danube enlarged its bridgehead across the Nitra River and on the 31st reached across the Vah River near Galanta. Not until 3 Apr had the Germans regrouped their forces to meet the situation created by the breakthrough. By that time the 3d Ukraine had taken Wiener Neustadt and arrived at Baden, while the 2nd Ukraine (astride the Danube) had reached the line Maly Karpaty Mountains —Bratislava (G)—Lake Neusiedler. In the south the left of the 3d Ukraine had passed Nagykanizsa.

The Russians at once attacked the new line, while continuing their offensive south of Lake Balaton. This moved northwest to Feldbach, 25 road miles from Graz. German reserves counterattacked on the 5th and drove this force back 12 miles to the Austrian border. The Bulgar First Army which formed the Russian left turned aside from Graz and advanced to Dolnja Lendava. Hard fighting occurred all around the Vienna area. Also on the 5th, the Russians captured Bratislava. At the same time the 2nd Ukraine was methodically working its way across the Maly Karpaty Mountains.

On 7 Apr the 3d Ukraine broke through again. An armored column pierced the line north of Baden, taking Moedling. Keeping right on, it encircled Vienna and reached the Danube at Klosterneuburg. North of the Danube the 2nd Ukraine was over the mountains and attacking the Morava River. Next day the Russians were in the south sector of Vienna; a street and house combat began. The Russians made steady progress through the city, reaching its center on the 9th. Next day the Germans gave up all of the city south of the river. The Russian Navy sailed up the Danube in a fleet of 4 gunboats; this effort failed, as the gunboats were an easy target for the German artillery.

Vienna fell on 13 Apr. South of the Danube the Germans established their line along the Traisen River. North of the river they fell back to the high ground from Goellersdorf to Feldsberg.

The Russians attacked the new line but it held, except opposite the right of the 2nd Ukraine, which advanced northwest toward Bruenn. On the 18th the line was

Weisse Karpaten Mountains—Strassnitz (R)—Auspitz (R)—Eibenschuetz (R)—Pohrlitz (?)—Neusiedl (G)—Lundenburg (G)—Morava River to opposite Malacky (R)—Korneuburg (G)—Danube River—Traisen River—Semmering Pass (G)—Friedberg (R)—Fuerstenfeld (?)—Fehring (G)—Murska Sobota (R)—Mura River—Drava River—Slatina (G)—Brod (G)—Drina River.

Operations of the 1st and 4th Ukrainian Army Groups

These two forces (respectively in Silesia northwest of Ratibor (exc), and from Ratibor to south of the Carpathians) have been attempting to advance southwest and west. Their line was

Goerlitz (G)—Lauban (G)—Katzbach Mountains—Eulen Mountains—Neisse (town) (G)—Neustadt (G)—Leobschuetz (G)—Ratibor (G)—Strumien (?)—Bielsko (R)—Zywiec (?)—Nowy Targ (R)—Zakopane (R)—Vazec (?)—Valaska (R)—Hron River.

The Germans held Glogau and Breslau as road blocks in rear of the Russian lines. Breslau was actively invested, with main attacks on the south and west fronts.

On 22 Mar the front between Neisse and Leobschuetz, which had been very active, quieted. The Russians had advanced to the foothills of the Sudeten Mountains and claim to have taken 15,000 prisoners. They were unable to go further, being stopped by the terrain and German counterattacks. Toward the end of the month the Russians shifted their attacks to the vicinity of Ratibor, which city they entered on the 30th.

A new shift in the direction of attack was made; the 4th Ukraine attacked westward on the south side of the Carpathian Mountains, down the Vah valley. This was hard country, full of rough ground and forests. Night attacks were freely used. By 11 Apr the Russians reached Vrutky area. Considerable hard fighting followed, including in the Ratibor area. By 18 Apr the line south from Ratibor had been advanced to

Ratibor (R)—Bogumin (?)—Skoczow (R)—Zywiec (?)—Zilina (G)—Vetrene hole Mountains—Trencin (G)—Veseli (R).

Glogau had fallen to the Russians on 1 Apr. Breslau, notwithstanding a most active investment and heavy air bombings, was still holding.

Operations Along the Baltic Coast

The 2nd White Russian Army Group was actively engaged in the reduction of Gydnia and Danzig. Both places were captured on 29 Mar. The Germans saved a part of the garrisons, which withdrew northward to the Hel peninsula and eastward to a beachhead east of Danzig, at the mouth of the Vistula River. Both of these beachhead are still being supplied and supported by the German Navy, which keeps the Russians from using the captured ports.

The 3d White Russian Army Group has been reducing the city of Koenigsberg since the end of January. A new and very powerful attack was launched on 6 Apr. It penetrated into the inner city on the 8th. Under day and night attack, the city surrendered at 2330 hours on the 9th—one of the exceptional cases of a German surrender. The Russians claim to have taken 92,000 prisoners between 6 and 9 Apr. Part of the German garrison escaped and with troops in the adjacent Samland withdrew to the Pillau peninsula, which they still hold.

The large German beachhead in Latvia has been attacked but continues to hold out approximately along the line Tukums (G)—Saldus (G)—Priekule (?)—Rucava (R).

The Attack on Berlin

On 16 Apr a major offensive was launched by two Russian Army Groups. The 1st White Russian attacked from the vicinity of Zehden to the mouth of the Neisse River, a 65-mile front. The mission was to seize Berlin from the north and east. The 1st Ukraine attacked on a 40-mile front along the Neisse River from Forst to Rothenburg. A powerful artillery preparation was first fired. Details of this battle are not yet available, but it appears that on the first day Russian efforts were directed to blasting gaps through the German defenses

through which armored forces could advance into the rear areas.

On the 17th the Russians were nearly through the German main zone of resistance. The 1st White Russian reached the line **Freienwalde (G)—Wriezen (R)—Seelow (R)—Mullrose (G).** The fortified city of Frankfurt was bypassed.

Armor of the 1st Ukraine got through and by night had reached the area around Spremberg.

On 18 Apr the 1st White Russian in hard fighting made a maximum advance of 7 miles from Seelow to Muencheberg, exclusive. The 1st Ukraine split—a north column started for Berlin and reached the vicinity of Drebkau, a south column closed on Bautzen from the north and east. Frankfurt was holding as a road block.

In these three days of fighting Russian tank losses (according to German reports) were around 400 a day. Presumably they were replaced, as the Russians were not stopped. As this account closes the battle for Berlin is well under way.

ITALY (19 Mar to 18 Apr 45)

Under Gen. Mark W. Clark at the beginning of the period the 15th Army Group with the U. S. Fifth Army on the left and the British Eighth Army on the right held the line **Viareggio (A)—Gallicano (G)—Barga (A)—Fanano (A)—Montese (G)—Vergato (G)—Loiano (G)—Bisano (G)—Castel Bolognese (A)—Senio River (German bridgehead about Lugo)—Reno River to the Adriatic Sea.**

The entire front was generally quiet, as it had been for three months preceding. Commencing on 20 Mar American raids were made frequently on the Ligurian coast, and were extended a few days later to the sector about Vergato. At the end of the month raids were regularly made by the British on the Adriatic coast sector. These were in preparation for a general offensive.

On 2 Apr, to secure a base for a proposed amphibious operation across Lake Comacchio, a British amphibious force landed on a sand spit which separated that lake from the sea. The sand spit was thereupon expanded into a base. On 4 Apr, on the opposite coast, American limited attacks gained ground north of Viareggio. On the 6th the British started to clear the narrow band between the Reno River on the south and Lake Comacchio on the north. American limited attacks continued on the Ligurian coast on the 7th and reached the high ground southeast from Massa. This fighting was on a narrow front between mountains and the sea, which was very hotly contested.

On 9 Apr the British Eighth Army launched a major attack on its right. An air preparation took place during the afternoon, on an 8-mile front between Lugo and Alfonsine. Over 3,000 100-lb. bombs were dropped on the enemy's advance lines, separated by the Senio River. That "river" is only 40 feet wide; it is really a canal, confined between levees; its water level is above that of the adjacent country. To make sure that the air force did not bomb the wrong side of the river the troops established vividly colored markers on the east side of the Senio. They also set off smoke candles. These measures marked the line very well for leading air waves. Thereafter the smoke and dust from the exploding bombs joined with that from the smoke candles obscured the targets. After the bombing flame-throwing tanks sprayed the far side of the Senio with liquid fire. Most Germans had left by that time. During the night the crossing was completed. Next day the line advanced about 2 miles, the German bridgehead about Lugo being eliminated. On its flank the Fifth Army, continuing its limited attacks, captured Massa.

On 11 Apr the British continued their advance and at places reached the Santerno, another "river" similar to the Senio. From the previously mentioned sand spit an amphibious expedition sailed across Lake Comacchio and landed east of Argenta at a point about 4 miles in rear of the enemy's left. In the afternoon the British established a bridgehead over the Santerno near Massa-Lombarda, after the Air Force had dropped 1,700 tons of bombs in the vicinity. The Fifth Army, near another Massa, advanced about 3 miles against strong opposition. Fighting was intense on the 12th, the Germans employing Tiger tanks brought from their reserve. The left of the British attack was extended to the vicinity of Imola by Italian troops (who were on the south side) and Poles (on the east).

On 13 Apr the British captured Massa-Lombarda and Conselice; the Americans moved on toward Carrara. Further progress was made next day.

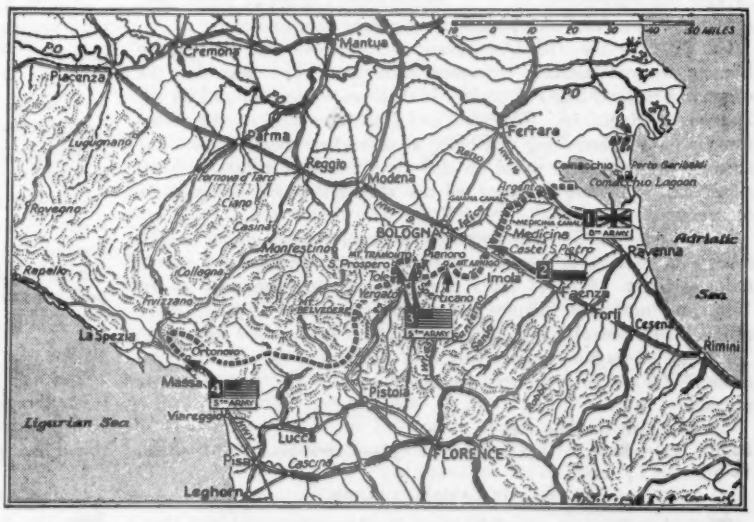
The 15th was a general preparation for the main attack on the ensuing morning. The general objective was the capture of Bologna and Ferrara. A new attack was launched by the Fifth Army, which captured high ground just west of Vergato. The Air Force sent more than 1,200 heavy bombers to Bologna; they attacked targets in that vicinity with 2,374 tons of bombs, the greatest air effort yet made in the Mediterranean Theater. Slight advances were made on the two coasts, which included the capture of Imola by the Polish II Corps.

The 16th saw the opening of the main Allied attack. A General Order was issued announcing it as "the spring offensive." Besides the attacks along the coasts, the Fifth Army launched a new operation north from the Vergato sector. Vergato was taken. The Polish Corps advanced from Imola to near Castel San Pietro, which was reached on the south by Italian troops. The New Zealand 2nd Div from Massa-Lombarda arrived within 3 miles of Medicina. German opposition nowhere showed signs of weakening; fighting was intense.

Next day the British V Corps on the right by-passed Argenta to the north and advanced toward Porto Maggiore. An Indian division captured Medicina, and the New Zealand division moved forward just to the north. The Polish Corps captured Castel San Pietro. In the center American troops advanced against fanatical resistance through difficult mountain country. On the west coast other American troops advanced up the beach to Carrara.

Slight advances were made on the 18th. A large scale attack was planned for the afternoon against Bologna, which was to be approached from the south and east. Preceding the ground advance a heavy air preparation was ordered. At the request of the ground troops the air preparation was cancelled, in the belief that the Air Force was not fully acquainted with the location of front lines. A very large force of fighters and fighter bombers aided the troops throughout the day.

At the close of the period the line was **Ameglia (G)—Carrara (A)—Barga (A)—Fanano (A)—Montese (G)—Zocca (G)—Sasso (G)—Pianoro (G)—Castel San Pietro (A)—Medicina (A)—Argenta (?)—Lake Comacchio.**



As the period closed, British troops of the Eighth Army (1) took Argenta and battled along Highway 16, while Polish units (2) drove beyond Castel San Pietro to points within 9 miles of Bologna. In the central sector (3) Americans of the Fifth Army reached the outskirts of Pianoro, while other forces of the same army took Mount Tramonto and San Prospero. On the Ligurian coast (4) the Americans advanced a mile northwest of Ortonovo and were 10 miles from La Spezia.

THE PHILIPPINES (19 Mar to 18 Apr 45)

Operations have been scattered over a wide area. On the east side of the central Luzon plain extensive operations have been conducted against Japanese holding the mountain ranges bordering the plain. On the west side of the plain a minor operation has been under way against the enemy in the mountains in that side. Others have been conducted in south Luzon, and on various islands to the south thereof.

About the Marikina Valley

At the beginning of the period the XI Corps held the line
Wawa (Jap)—Bosoboso (J)—Pinugay (J)—Tanay (J).
The 6th Inf Div was on the left and the 43d on the right. On 19 Mar the latter captured Tanay by a 1-mile advance, then turned left up the Morong valley. The enemy held mountain positions based on artificially constructed caves on sides of steep slopes which were very difficult, or impracticable, to bomb. In continuous attacks, most of the low country before the enemy's main position was taken by the 21st, together with what appeared to be his motor train of over 250 vehicles. The enemy was equipped with artillery up to 155-mm caliber, and had rocket launchers which were effective at short ranges, the dispersion being great at anything over 2,000 yards. After a series of small but constant attacks with limited objectives on the 23d, the 43d Inf Div was a mile from Bosoboso.

On 1 Apr troops from the 43d Div advanced around the north side of Laguna de Bay about 9 miles beyond Tanay. Enemy resistance along the main front was serious and the advance was very slow. Some Japs infiltrated at night, and a few reached the Marikina valley near the town of that name and north thereof. The advance around the Laguna de Bay was completed on 6 Apr, when troops from the north reached Lumban and met other troops from the 1st Cav Div coming from the south.

On 11 Apr the 6th Div started attacking toward Ipo from near Kay Banban in very difficult country.

A week later the line had not materially changed and was
Kay Banban (?)—Ipo (J)—Wawa (J)—Bosoboso (J)—Sampalok (J)—Santa Maria (US).

East of Lingayan Gulf

The enemy's main force continues to be in the Cagayan valley, which was being attacked by our I Corps from the south. On 19 Mar the line was
Aringay (US)—Rosario (US)—Imugan (J)—Carranglan (US)—Baler (US).
Three infantry divisions (33d, 32nd, and 25th) were attacking. The 33d had Baguio for its objective, the other two divisions Balete Pass. Attacks were daily, usually with limited objectives. The enemy's defense was vigorous; it included counterattacks, many of which were at night. The Air Force pounded the enemy continuously.

On 20 Mar the 33d Div advanced 10 miles from Aringay to Bauang without meeting strenuous resistance. The next day the command reached San Fernando. It then turned inland, and on the 2nd was at Naguilian. The 32nd and 25th Divs were having a continuous fight in attacking and being attacked near Balete Pass. The enemy's positions were based on cliff caves and high ridges. Heavy rains and fogs were frequent at the altitudes where battles were occurring.

On 31 Mar the 33d Div captured Galiano, 9 miles inland and 10 miles west of Baguio. It took until 11 Apr to advance the next 2 miles to Salat. Asin (3 miles from Baguio) was captured on the 13th, and next day Baguio was almost reached. The Air Force dropped 540 tons of bombs this day to clear a passage for the troops. The edge of Baguio was reached (but not taken) on the 17th and about 7,000 civilian prisoners previously held by the Japanese were rescued.

On the 18th the line was
Baguio (J)—Rosario (US)—Imugan (J)—Carranglan (US)—Baler (US).

In the Zambales Hills

There has been no material change in the situation of an enemy force, estimated as about a division, located in the hills just west of Clark Field and Fort Stotsenburg. Since the end of January (when this operation was started) to include 19 Mar, enemy losses are reported as having been 2,654 killed.

South Luzon

The XIV Corps was charged with clearing south Luzon, all of which (except that part north of Lake Taal) was in enemy possession on 19 Mar. On this date the 11th Airborne Div and 158th Combat Team had arrived southeast of Lake Taal, and were sweeping forward against minor enemy detachments. The 1st Cav Div (dismounted) operated around the north end of Lake Taal from Santo Tomas, against greater enemy resistance. By the 27th the cavalry had advanced 2 miles to Tanauan and the airborne troops 16 miles to Lipa. It was officially announced that no organized enemy remained in south Luzon.

The 1st Cav Div now moved east, reaching San Pablo on 1 Apr. On the 6th the 11th Airborne Div by an air operation landed at and seized Lucena, while the 158th Combat Team having moved by water occupied Sorsogon at the south tip of Luzon. By 8 Apr the cavalry and airborne divisions held the line Lucban—Tayabas—Lucena. Two days later it had advanced 20 miles to Atimonan and the 158th Combat Team had moved north to Legaspi. Thereafter it met some resistance and its advance north was slowed; it reached Oas on the 13th.

From the north, the airborne troops jumped 30 miles on the 12th to Calauag. No material change occurred thereafter.

Miscellaneous

Panay. The 40th Div, which had landed west of Iloilo on 18 Mar, moved forward promptly against that city with its right, while the left moved northward inland in connection with strong guerrilla forces, who had previously cleared most of the island. Iloilo was taken on the 20th. Guimaras Island, formerly the site of an army post and adjacent to Iloilo, was occupied on the 22nd. Panay was practically cleared without major fighting within the next few days.

Cebu. The Americal Div on 26 Mar landed 5 miles southwest of the city of Cebu. Although it was officially announced that this move caught the enemy "off guard," the evidence is contradictory. The first wave of troops landed at 0830 hours. Immediately the enemy set fire to numerous objectives in Cebu and completed the starting of fires in 52 minutes, as observed by the OPs. Considerable opposition was met on the beach. The Buffaloes used in landing reached the shore, but the enemy's fire was so severe that the men had to dismount and advance on foot. With the help of naval fire and air bombing the enemy, who was of inferior strength, was overcome. Cebu was captured next day, the Japs withdrawing to hill and cave positions, also apparently previously prepared, to the northeast. At the close of the period the enemy was under close investment.

Caballo is a tiny island at the entrance of Manila Bay, formerly Fort Hughes. Its sides are precipitous; landings have always been difficult. The 38th Div did land on 27 Mar. No details are yet available. By 31 Mar an extensive tunnel and cave fight was under way, largely underground. Ammunition and supplies were hoisted by ropes up the cliffs, and wounded were evacuated by lowering from cliffs directly onto ships below. It is understood the island was cleared.

Negros. On 29 Mar the 40th Div landed on Negros almost directly across from Iloilo. The enemy withdrew to a hill and cave position near the northwest tip of the island, and was still there at the end of the period, under close investment. He also held a smaller position at the southeast corner of the island, near Dumaguete.

Tawitawi island was seized on 5 Apr. It is intended to utilize its airfield as a base for the air blockade over the south China Sea.

Zamboanga. The 41st Div, which had landed near that city on 9 Mar, reported completion of the occupation on 7 Apr, the enemy having retired to hill and cave positions to the north. Casualties for this campaign were reported as:

	Killed	*Wounded*	*Missing*	*Prisoners*	*Total*
American	131	533	2	—	666
Japs	2,297	—	—	59	2,356

Jolo. After a 2-week air preparation, troops of the 41st Inf Div occupied Jolo on 9 Apr. There was no serious resistance.

Illana Bay. On 18 Apr the X Corps with the 24th Div landed at Malabang (noted for rough surf) and Parang, on the south coast of Mindanao. They were joined by Fertig's Guerrilla Division, which

had been previously operating on shore. From the beachheads secured there is a good road to Davao, 120 miles away. The enemy did not resist the landing. His forces are reported as the 30th and 100th Inf Divs, and a Marine division.

THE WAR AGAINST JAPAN (less the Philippines) (19 Mar to 18 Apr 45)

Southeast Asia

Three British commands have operated to free Burma from three Japanese Armies: 33d, 15th, and 28th.

In *Arakan Province,* along the sea, the Indian XV Corps has been making slow progress. An amphibious expedition which on 13 Mar had landed north of Taungup captured that place on 15 Apr, thereby eliminating the last Jap strongpoint on this coast. At the end of the period the line was Masin (Jap)—Taungup Pass (Jap)—An Pass (Jap)—Mon River.

In *Central Burma,* on 18 Mar the British Fourteenth Army was investing Mandalay with the XXXIII Corps, while the IV Corps had advanced from the west and reached Meiktila, from where it was seeking to envelop the enemy in the Mandalay area. Resistance at Mandalay was confined to Fort Dufferin, which is a huge park about 1½ miles square inside a stone wall covered by a moat very suitable for defense. In the park is the Government Center. Considerable difficulty was had in taking this place. On 22 Mar, following an air strike, the Indian 22nd Div captured it.

The Indian 19th Division was then sent south from Mandalay while the IV Corps moved north from Meiktila. Both movements received heavy opposition. It was necessary to bring in the British 36th Div, which belonged to the Northern Combat Area and was near Mogok, northeast of Mandalay. Making a rapid march, it arrived at Kyaukse on the 30th, and the place fell.

Since then operations have been directed toward the mopping of enemy detachments between Mandalay and Meiktila and the Irrawaddy River on the west. By 18 Apr this area had been nearly cleared. Part of the enemy went south, but other forces went east toward Taunggyi. On Apr 18 the line was Yenangyaung (Jap)—Meiktila (Br)—Heho (Jap)—Kyaukse (Br).

In *North Burma* the Northern Combat Area is in charge. There have been only slight changes other than the movement of the British 36th Div already mentioned. The Chinese 50th Div holds the center, and the Chinese First Army the left. On 18 Apr the line was Kyaukse (Br.)—Hsipaw (China)—Mongyai (C)—Nawnlong (Jap).

The outstanding feature of the Burma campaign is the joint American and British air transport service. Supplies to the front have been forwarded almost entirely by air. During last March about 90,000 tons of stores were delivered by the ATS. In addition personnel was carried, and sick and wounded were evacuated.

Southwest Pacific Command (Less Philippine Islands)

Ground operations by Australian troops have continued in northern New Guinea and on Bougainville. In New Guinea two columns are moving east toward Wewak, one along the coast and the other down the Sepik valley. These reached a line about north and south 6 miles east from Dagua. Few reports have been noted regarding results obtained on Bougainville, where the enemy holds Buka, Kieta, and Buin. Main operations are on the Puriata River.

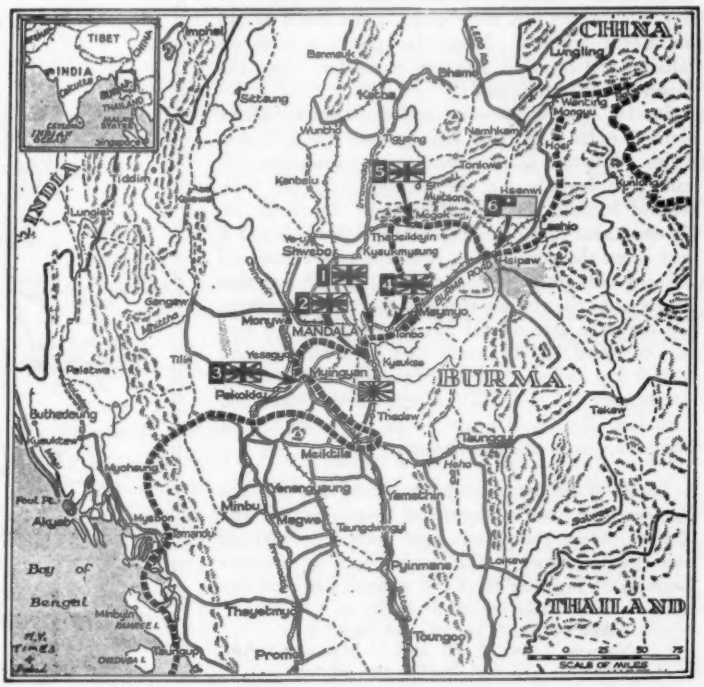
Air operations over the Netherland Indies (less Sumatra, Java, and south Borneo) have continued on a reduced scale. The present air mission appears to be toward sinking all craft circulating among the islands and thereby reduce the Japanese occupation forces to a state approaching destitution. New Britain, New Ireland, and Bougainville are bombed regularly.

Pacific Fleet Command

Air attacks made in connection with reconnaissance flights have continued against the Kurile Islands, Marcus, Wake, the Bonins and Palaus, Yap, Truk, and in the Marshall Islands. Very extensive air operations have been conducted against Japan, and amphibious operations in the Ryukyu Islands.

On 19 Mar the 5th Fleet had just completed an air attack against Kyushu, mainly to neutralize enemy air fields. It then moved SSW off the Ryukyus, where it was attacked by Japanese planes on the 21st. We lost 1 destroyer damaged, and downed 50 planes according to our reports—150 admitted by Jap accounts. On the 23d the Fleet commenced to heavily shell certain Ryukyu islands, wtih main effort against Okinawa. On the 25th and 26th it landed elements of the 77th Inf Div on the Keramas, 15 miles west of the south tip of Okinawa. Shelling and bombing of Okinawa were intensified.

On 1 Apr the Fleet landed the Tenth Army, with the XXIV and



After a 12-day siege Mandalay (1) fell to the British. Pushing east from the Irrawaddy River, other units neared Kyaukse (2). Still other units fought in the outskirts of Myingyan (3). East of Mandalay the road between Maymyo and Tonbo was cleared (4) and Mogok was captured (5). The Chinese were mopping up Hsipaw (6).

III Marine Amphibious Corps of 3 divisions each, being the largest amphibious force yet handled in the Pacific. Troops came ashore both north and south of the Katena airfield. No resistance other than patrols was encountered. The XXIV Corps on the right advanced south, the Marines north. By 4 Apr, meeting but moderate resistance, the Marines had advanced 9 miles to Yaga and the XXIV Corps about 3 miles southward. It became clear the enemy's main zone of resistance was to the south. Enemy opposition in that direction increased rapidly.

On 6 Apr a British detachment of their Pacific Fleet, which was attached to the U. S. 5th Fleet, attacked the Sakishima Islands by bombing and shelling. In that afternoon a large Japanese air force attacked the American warships engaged on both sides of Okinawa in shelling enemy shore positions in order to further the attack of the XXIV Corps. About 150 enemy planes were reported downed, with loss of 3 American destroyers and damage to other ships.

On 7 Apr a Japanese Task Force of 1 battleship (*Yamato*), 1 cruiser, and about 9 destroyers sailed south from Kyushu. This was a very small force compared with the opposing 5th Fleet, reported by the Japanese as including 10 American battleships. The Jap Task Force was attacked by planes of the Fleet before it had gone 50 miles; the *Yamato,* the cruiser, and 3 destroyers were sunk. The Jap ships had no air cover, but their AA fire downed 7 American planes. Later Japanese planes appeared and caused minor damage to the American

ships. On shore the XXIV Corps had a line across Okinawa just north of Ginowan and the II Marine Amphibious Corps was just south of Motobu peninsula.

Enemy resistance in the south had become serious. The enemy was well supplied with artillery, and was reported to have a garrison several times larger than the number of men in line, thereby assuring ample reserves for some time. He was reported as having mortars firing a 1,000-lb. shell, which would correspond to a 12" caliber or larger. Against this artillery, seemingly having plenty of ammunition, the attacking troops found it difficult to hold captured positions. The Navy daily shelled the Japanese positions, which were also heavily bombed. Marine artillery, not required in their sector, came south to aid the Corps artillery. Many Jap positions were on hillsides and caves—a defensive method in which the Japanese have specialized.

On 16 Apr troops were landed on Ie, an island about 5 miles long from west to east and half that width. It is a volcanic island, with an inactive volcano (Mt. Iegusugu) at the east end, and is 2½ miles west of Motobu peninsula, Okinawa. There was little opposition to the landing. Although the island is just about the same size as Iwo, it is very fertile and covered with green cultivated fields. By 18 Apr that part west of the volcano was held by American troops. On the same date the III Marine Amphibious Corps had occupied all the north part of Okinawa, and 85,000 Jap civilians had been brought under military government. The XXIV Corps (24th, 96th, and 77th Inf Divs) held a line across the south end of Okinawa, just north of Ginowan.

* * *

The 20th Air Force (super-bombers) has the 21st Bomber Command stationed on Guam, Saipan, and Tinian. From these bases, and with occasional aid from carrier planes of the Pacific Fleet, an intensive bombing of Japanese cities and airfields has been conducted. These have included attacks on

Tokyo on	**2, 7, 12, 14, and 16/17 Apr**
Nagoya	**24, 25, 30, and 31 Mar and 7 Apr**
Kyushu	**27 and 29 Mar and 18 Apr**

Marines at the end of the period reached the northern end of Okinawa (1), although this does not mean that we control the entire upper part of the island. On Ie Island (2) our troops gained against enemy forces that were resisting around Iegusugu peak. Mopping up continued on Motobu Peninsula (3) and American troops were still unable to advance in the southern sectors above Naha, the capital (4).

F.D.C. EXPEDIENTS IN THE E.T.O.

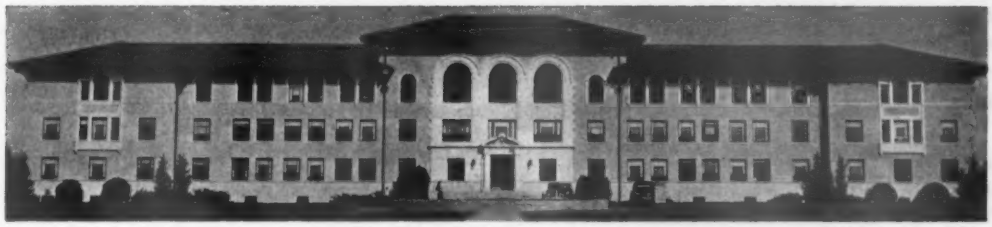
By Capt. William R. English, FA

In view of the rapidly changing situation our battalion of 155-mm guns (M1) encountered in France, plus the shortage of grid sheets and cellulose tape in the E.T.O., our fire direction personnel were forced to construct a permanent HCO chart out of material at hand in the combat zone. ¼-inch plywood, taken from a demolished German barracks, was cut to the size of the issue 31" x 42" drawing board and two grid sheets, carefully assembled, were pasted (flour and water paste) to the board. Over this were pasted sheets of Duro-Seal (issued only in the States, apparently). The result is a permanent firing chart (18,000 x 25,000 meters) which will hold plotting pins, take a soft pencil, and may be erased and used over again indefinitely. One distinct advantage is the elimination of shrinkage and expansion of the chart, the grid sheet being an integral part of the board.

The highly fluid situation (with targets frequently encountered at all points of the compass) usually found the battalion as a whole attached to a division, with each battery firing into a different sector. Firing battery personnel had of course been trained to handle their own fire missions in such a situation, but in order to centralize control and communications (and because the batteries had no CP tents or lighting system) the battalion FDC retained control of missions. Handling three widely divergent center lines on anything but a chart of prohibitive size necessitated three different grid systems on our HCO chart, each battery being plotted in a corner of the chart which would give the greatest coverage for that battery's fire possibilities. It was found the 1/50,000 map made an excellent VCO chart for such a setup, the 10-meter contour interval being sufficiently accurate for our weapon.

Position areas were tied to the 1/50,000 map by using a direction line from the map, if possible; a needle azimuth, if not. When corrected by registration on a check point selected from the map, it was found that accurate unobserved map fires could be laid down. Common control was seldom available in such a situation, especially when working with an armored division—and in fact was not needed, as the map itself provided sufficient control.

On two occasions the only maps available were 1/100,000. These were used in the same manner as the 1/50,000, and gave fairly good results.



F. A. S. EVENTS

Department of Combined Arms

Recently the Officers' Refresher Course has incorporated into the Maps subcourse a period of instruction on night navigation, designed primarily to give the students training in selecting and following routes at night. The problem is divided into four legs, each representing a different method of following a route at night: (1) ground forms, (2) compass, (3) memory, and (4) a photo map. Students work in pairs and move from one control point to the next until they have completed four legs, each by a different method. Senior instructor of the Maps subcourse is Maj. Charles A. Reinhard.

Field Exercise RSOP-25 given to OCS has been revamped and is now RSOP-25B. Under its new title it incorporates the employment of a battery with the advance guard of a combat team, occupation of position from the march, and a displacement forward and occupation of position under cover of darkness. It is now a firing exercise which adds much to its instructional value.

Demonstration T-13, Security of the Battery Position, now incorporates an example of perimeter defense as actually used by units in the South Pacific. In addition, the latest warning devices, mines, and personnel defensive weapons to guard against infiltration are employed to create a highly instructional demonstration.

Department of Communication

Col. J. F. Roehm reorganized the Enlisted Communication course. Beginning with the class 9 Apr 45 the course was divided into two sections, a Radio Operators' Section and a Radio Repairman's Preparatory Section. The latter has as its primary purpose the preparation of students for the Enlisted Radio Repairman's course, but instruction also will familiarize students thoroughly with field artillery communication. The training of wiremen and telephone operators within the Enlisted Communication course will be discontinued. Field Artillery Replacement Training Centers will train wire communication specialists.

Department of Gunnery

A new fire direction period has been introduced into the gunnery course for OCS and OSBC students. Utilizing the terrain boards which formerly were used for observed fire classes, it gives the students working as fire direction personnel a chance to see the results of massing the fires of a battalion without the expenditure of ammunition.

Both the observed fire chart and the grid sheet firing chart are used. A number of targets are selected as concentrations on each terrain board; coordinates are computed for them and for the battery positions so that the map data obtained will give "will-hit" data for the concentrations when corrected by "deflection correction" and "*K*."

Department of Materiel

Highlighting the demonstration given April 21st was the firing of the M12 self-propelled gun which has proved its effectiveness in all theaters of operation.

Another interesting attraction was the firing of the new M2 carbine, which can be fired as a semi-automatic or full automatic weapon at the cyclical rate of 750-775 rounds per minute.

The Department of Materiel has supplemented its materiel subcourse for Officer Candidate Classes with six more hours of instruction on heavy caliber weapons. This additional instruction will become effective with Class 145.

* * *

Field Artillery School Troops, under the command of Brig. Gen. George H. Paine, added a new unit this month with the arrival of the 526th FA Bn. Five batteries are included in the new battalion. Headquarters, Service, and "A" Batteries arrived from Camp Maxey, Tex.; Battery "B" came from Camp Howze, Tex.; and Battery "C" from Camp Livingston, La. The 526th was activated 17 Apr 44 at Camp Joseph T. Robinson, Ark. Lt. Col. Edgar E. DeMuth is its commander.

* * *

Back in the United States after six months in Italy as a member of the Army Ground Forces board observing field artillery operations, Col. Harold T. Brotherton has returned to his former post as S-3 of the Field Artillery School. Col. Brotherton relieves Col. John F. Roehm, who was designated S-3 for the school in January upon his return from the Southwest Pacific. Col. Roehm has been named director of the Department of Communication following the transfer of Col. James R. Wheaton, who had been director since April, 1944.

* * *

Col. Jan Krautwald and Lt. Col. Wladyslaw Polinski of the Polish Embassy and British Wing Commander D. I. McMonnies of the Royal Air Force were among the several visitors at the Field Artillery School this month. The two Polish army officers inspected various installations at the school and the FARTC. Wing Commander McMonnies made an inspection tour of the Department of Air Training.

Maj. Gen. Clyde L. Hyssong of Army Ground Forces headquarters and Brig. Gen. Ford L. Fair of the First Tactical Air Command, Esler Field, La., inspected School departments and installations.

Brig. Gen. Miles Cowles, commandant of the Tank Destroyer School, Camp Hood, Tex., also was a visitor.

* * *

Class No. 113 of the Enlisted Motor Course, Department of Motors, graduated March 24 with a class average of 84.1,

the highest average of any EMC class on record. Highest individual average among the students was 92. Of the 52 men in the class, 42 were qualified as motor sergeants and 10 as skilled mechanics. 16% of the graduates received superior ratings.

* * *

On the sports front the 8th Regiment FARTC was crowned champion of the post enlisted men's league, and the Field Artillery School detachment officers won the officers' league title. Baseball opened at Fort Sill Tuesday night, May 1, with a game at Butner field. Twenty teams have entered this season's diamond league.

* * *

The School's ambulance plane has been returned to duty following a trip through the overhaul line of the Department of Air Training. A trip through the overhaul line means the plane has been rebuilt, the engine overhauled, and it now again stands ready for emergencies. Painted white, with large red crosses identifying it, the plane is available for any post emergency during normal duty hours.

* * *

Brig. Gen. William W. Ford, an early advocate of the use of liaison "grasshopper" planes in field artillery warfare and former director of the Department of Air Training, has been awarded the Legion of Merit for his "untiring efforts and initiative" in directing the development of the department. Gen. Ford is credited as "the man who sent the 'grasshopper' plane to war." He was the first director of the Department of Air Training when it was established as a new branch of the Field Artillery School in December, 1941.

* * *

The third annual "Aggie Muster" for former Texas A. & M. students stationed at Fort Sill was held the night of April 21 in the Polo Club on the military reservation. Captain Jack Harding, commanding officer of the Field Artillery Observation Training detachment, was chairman of the affair. A special film prepared at Texas A. & M. showing the latest developments at the school was shown.

* * *

Word was received here recently that Col. Garrison B. Coverdale, former director of the Department of Animal Transport, is now in the China sector as commandant of a Chinese training center field artillery school.

* * *

Creation and perfection of the Graphical Firing Table, "an ingenious instrument which facilitates the calculation of data for field artillery batteries," has earned for Lt. Col. Abbott H. Burns, Department of Gunnery, the Legion of Merit.

* * *

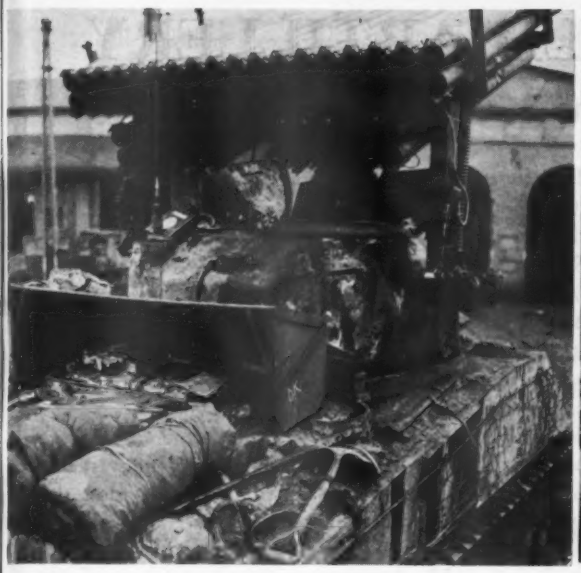
Personnel Changes

Arrivals

Name	*New Duty*
Col. Harold T. Brotherton	S-3 Section
Lt. Col. John A. Todd	Dept. of Communication
Maj. Howard L. Crouse	
Maj. Allston S. Goff	Office of Asst. Comdt.
Maj. Paul G. Keating	Dept. of Gunnery
Maj. James L. Lain	
Maj. Ronald G. Martin	Officers' Refresher Course #2
Maj. Arthur W. Reed	Dept. of Gunnery
Maj. Elmer L. Whitman	Dept. of Gunnery
Capt. George F. Adam	
Capt. William A. Benincosa	Dept. of Observation
Capt. Joseph J. Brewer	FAS Detachment
Capt. Gordon I. Conn	Dept. of Gunnery
Capt. Robert I. Coppes	Dept. of Combined Arms
Capt. Thomas W. Curley	Dept. of Gunnery
Capt. Buhl B. Fitzsimons	
Capt. Edward N. Henry	
Capt. Robert M. Henry	Dept. of Communication
Capt. Joseph P. Holloway	Dept. of Materiel
Capt. Walter W. King	Dept. of Air Training
Capt. David F. Kohn	
Capt. Loyd W. Lovestedt	FAS Detachment
Capt. Forbes P. McCreery, Jr.	FAS Detachment
Capt. Paul L. McGiven	Officers' Communication Course #2
Capt. Marshall J. Pujo	S-1 Section
Capt. Harold J. Reedy	
Capt. Robert J. Riekse	Dept. of Combined Arms
Capt. William O. Rockwood	Dept. of Combined Arms
Capt. John L. Ruby	Dept. of Materiel
1st Lt. Alexander Bolding	
1st Lt. Hubert E. Bowen, Jr.	
1st Lt. Field Duskin	
1st Lt. Allen H. Hokanson	Dept. of Motors
1st Lt. Joseph Pagano	S-3 Section
1st Lt. Robert P. Spengler	Dept. of Materiel
2nd Lt. Edward Goldfischer	
2nd Lt. James L. Rilea	

Departures

Name	*New Duty*
Col. Edwin A. Henn	Hq. Sch. Trps., FAS, Ft. Sill
Lt. Col. Robert D. Heeschen	FAORP, FARTC, Ft. Sill
Lt. Col. John G. Keller	FAORP, FARTC, Ft. Sill
Lt. Col. D. A. Mathewson, Jr.	FAORP, FARTC, Ft. Sill
Lt. Col. Gerald L. Roberson	Overseas
Lt. Col. John A. Todd	ASF Regional Hosp., Ft. McClellan
Maj. Russell P. Grant	560th FA Bn., Ft. Bragg
Capt. George D. Arthur, Jr.	FAORP, FARTC, Ft. Sill
Capt. Harry J. Barbera	Hq. AGF, Washington, D. C.
Capt. Richard L. Brown	FAORP, FARTC, Ft. Sill
Capt. William L. Garner	Hq. XXXII Corps Arty., Ft. Bragg
Capt. John M. Hannan	Overseas
Capt. Boyd O. Hatch	FAORP, FARTC, Ft. Sill
Capt. Thomas S. Hostetter	FAORP, FARTC, Ft. Sill
Capt. Vincent B. Januska	Overseas
Capt. Adrian C. May	FAORP, FARTC, Ft. Sill
Capt. James E. McDonald	AGF Repl. Depot #2, Ft. Ord
Capt. Harold J. Reedy	415th FA Gp., Ft. Jackson
Capt. Charles M. Sanders	FAORP, FARTC, Ft. Sill
Capt. Wayne A. Thompson	FAORP, FARTC, Ft. Sill
Capt. Norman S. Weber	FAORP, FARTC, Ft. Sill
Capt. Darwin Whittenburg	FAORP, FARTC, Ft. Sill
1st Lt. Ventura M. Barata	FAORP, FARTC, Ft. Sill
1st Lt. Alexander P. Bolding	AGF Repl. Depot, Ft. Ord
1st Lt. Thomas C. Coale	AGF Repl. Depot, Ft. Ord
1st Lt. Eric Darmstaedter	FAORP, FARTC, Ft. Sill
1st Lt. Stanley H. Davis	AGF Repl. Depot, Ft. Ord
1st Lt. Richard E. Ebner	FAORP, FARTC, Ft. Sill
1st Lt. Philip H. Fairchild	FAORP, FARTC, Ft. Sill
1st Lt. William G. Fritz	Dept. of Air Trng., Ft. Sill
1st Lt. Leo N. Goche	FAORP, FARTC, Ft. Sill
1st Lt. Raymond Hirschman	T.C. ORP, Brooklyn, N. Y.
1st Lt. Clifford A. Myers, Jr.	FAORP, FARTC, Ft. Sill
1st Lt. Alvar B. Sandquist	FAORP, FARTC, Ft. Sill
1st Lt. Ray C. Snodgrass	FAORP, FARTC, Ft. Sill
1st Lt. Robert P. Spengler	Borden General Hospital
1st Lt. John M. Tetens	FAORP, FARTC, Ft. Sill
1st Lt. Deane P. Wiley	FAORP, FARTC, Ft. Sill
1st Lt. Frederick E. Wood	Ohio River Engr. Div., Columbus, O.
2nd Lt. Donald B. Allen	FAORP, FARTC, Ft. Sill
2nd Lt. Lemuel A. Bell, Jr.	Hq. XXXII Corps Arty., Ft. Bragg
2nd Lt. Floyd C. Erickson	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Woodrow W. Harrell	Overseas
2nd Lt. James L. Rilea	FAORP, FARTC, Ft. Sill
2nd Lt. Robert A. Schlink	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Thos. R. Williamson	FAORP, FARTC, Ft. Sill

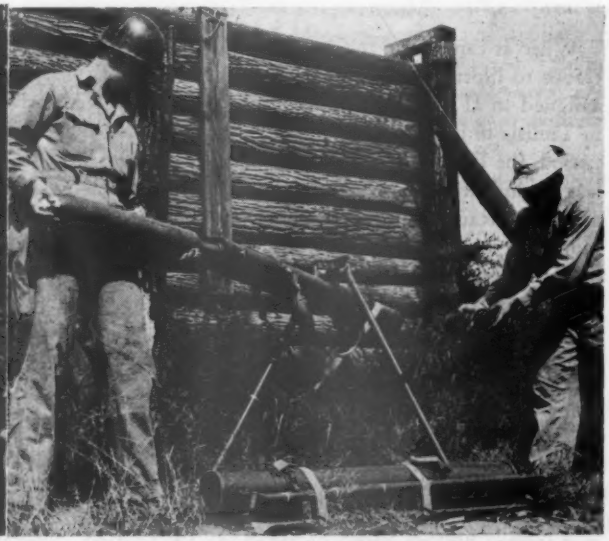


M-4 tanks are being fitted with 60-tube rocket launchers. Laying for direction is by traversing the turret. Elevation can be varied just before firing. Rockets can be fired singly or simultaneously. When all have been discharged, a hydraulic mechanism can be used to jettison the entire rocket assembly; it pitches it up and backward, clear of the tank. Photo at left shows shield to deflect blast from air vent and so keep the flames of discharge from entering the tank; all inflammables should of course be removed from tank top before firing rockets.

LAND-BASED ROCKETS

Saipan saw the Marines' first use of mobile rockets. These truck mounts were ideal for Iwo Jima—hit-and-run tactics prevented the Japs from getting a fix on their positions.

For barrages, 12 of these British 32-barrelled projectors are used together. Resultant fire power is similar to that of 280 5.5" guns (which fire 100-lb. shells), but a rocket battery needs less than 200 men.



Our own army has a light-weight rocket launcher for use by ground troops. Fitted with tripod mount, it folds compactly for easy carrying. Here is a good idea of its appearance and size.

FULL USE OF FIELD ARTILLERY

By Maj. Gen. John A. Crane

AUTHOR'S NOTE

The essence of field artillery is the maneuver of fires. Artillery furthers the will of a commander best when he can place the fires of all the guns that will bear on the points where he needs fire most. In the corps, this may mean firing the guns of one division in the sector of another; in the army it may mean coordinating the fires of its corps artilleries. The principle is advanced here that artillery control should be so centralized that any target can be attacked by every gun within range. This principle is developed in five stages.

Prewar Doctrine

When Gribeauville fathered modern artillery, ranges were short and indirect fire was unknown. The maneuver of fires was effected by galloping the guns themselves about the battlefield. With independent sighting and long ranges, guns can stay in position for relatively long periods and shift their fires promptly wherever they are needed most—provided always that division or corps boundaries do not interfere. This interference is minimized as control is centralized.

Unified control of large masses of artillery developed during the first World War. It reached a high point of development in the German Hutier Taktik at Verdun, under von Mackensen in Galicia, and in both German and Allied drives in 1918. The fires of every piece of artillery in corps and even in armies were coordinated. During the years of peace between World Wars higher tactical staffs were disbanded, budgets were cut, and artillery thought in our army concerned itself most with artillery in the division. Marked progress was made in fire direction. The combat team idea won favor. Little was said of corps artillery, which came to be considered as something archaic and vague. Corps artillery officers and their staffs disappeared into the war strength columns of Tables of Organization.

Development of Centralized Artillery Control in the Mediterranean Theater

When it came time for us to fight once more, and we sent troops to North Africa, the 13th Field Artillery Brigade was assigned to II Corps. Brigade Headquarters Battery arrived in Tunisia in February, 1943. In England, during the staging period, the Brigade was told that its 155-mm guns were to be left behind, leaving only 155-mm howitzers as non-divisional artillery. Rather reluctantly, and just before the expedition sailed, the regiment of guns (less a battalion) was reinstated on the troop list. The battalion that went to Africa initially was rushed from the boat at Oran to support the British front. When American units in Tunisia were assembled under II Corps, many of the corps artillery units came under corps command.

A good deal of the time, very properly, units were attached to divisions. This is frequently desirable. It is important to remember that when a corps artillery unit can fire in front of but one division it should be taken out of corps control. When, in a rapidly moving situation, corps can not exercise adequate control over its groups and battalions, they should be decentralized to divisions.

Initially even our best division commanders resented having in their division areas corps artillery units which were not attached to them. It took great diplomacy to overcome their resistance. Most were utterly oblivious to the fact that properly dispersed corps artillery not only could assist them, even though firing from other division areas, but should also be put in their areas to assist adjacent divisions and corps. It was a long, hard struggle, but eventually, through three campaigns, the idea won acceptance.

In Sicily the 13th Brigade with one armored field artillery group was still the only American corps artillery in the European war. Its units were distributed to divisions for the amphibious phase—an entirely logical procedure. Three weeks after the landings, however, Brigade Headquarters, Observation Battalion Headquarters, and one regiment of 155-mm howitzers less a battalion were still in Africa. The Brigade Commander finally got over. He was greeted enthusiastically by General Patton, who immediately gave him every gun that did not belong to the three infantry divisions then on the line. First one regimental headquarters battery functioned as brigade headquarters battery and then the other, aided by corps signal troops. Brigade Headquarters arrived on the day the campaign ended.

In Italy the Brigade functioned as general support artillery for the VI Corps. The Brigade Commander now wore two stars, and found this circumstance of distinct advantage when talking with division commanders. The Brigade supported the corps on fronts varying from 7 to 70 miles, and finally worked up to the direct control of thirteen battalions, including a Canadian regiment of 5.5-inch guns. It had battalions, regiments, groups, and at one time the whole division artillery of an armored division attached.

Centralized Artillery Control in the Offensive

In Italy our counterbattery fires came into their own. In Tunisia and Sicily the popular conception of counterbattery was a parrying of enemy fires, in passive defense. When our men were receiving fire they wanted their artillery to put some rounds out and persuade the offending guns to stop. In Tunisia there were duels between American and German batteries, with the gun crews on both sides jumping out of foxholes to fire and then jumping back to escape the answering volley. Defensive counterbattery fires are often laudable and very necessary, but they are not the primary purpose of the corps artillery intelligence and counterbattery agencies. Counterbattery work is of greatest value in preparing a major breakthrough.

To an extent not seen before in our army in this war, the periods of stabilization before the Garigliano and on the Anzio Beachhead were artillery battles. Because the artillerymen did their job thoroughly and well, German guns were unable to stop our breakthrough on the Garigliano and our breakout from the Anzio Beachhead. It was demonstrated again that when an army has been stopped by enemy defenses, it relies upon artillery to a large extent to get started again.

The sector of the Corps Expeditionnaire Francais on the upper Garigliano was the zone of action of our 13th Field Artillery Brigade. Here, from an artillery point of view, the

11 May offensive was a complete success.

". . . General neutralization of hostile batteries was provided, for forty minutes at H-hour and for thirty minutes at H+2 and again at H+4. . . .

". . . H-hour was fixed at 2300 hours, 11 May. A large part of our artillery had not revealed itself until then. . . .

". . . The first German rockets asking for defensive fires were seen at about 2310 hours. Hardly any enemy artillery reaction was reported during the first hour. . . .

"General neutralization was undertaken again at the prescribed hours. In the intervals, partial neutralization of three groups of enemy batteries had been effected. OPs reported the virtual cessation of enemy artillery activity during the period of our fires. Our infantry took Mt. Faito. On the following two days our counterbattery fires had the same success. The evening of 13 May our infantry took Mt. Majo and a new phase of the battle commenced. . . . In this phase, counterbattery fires principally coincided with fire on highways over which the enemy's batteries were attempting to retreat."—Corps Expeditionnaire Francais, *Contrebatterie* (2 June 44), p. 3.

The pattern of II Corps attack fires on the lower Garigliano on 11 May was similar.

". . . The effectiveness of our counterbattery fire also became quickly evident because of the appreciably reduced shelling received from enemy artillery as our forces advanced. . . ."—II Corps, *Lessons of the Italian Campaign*, p. 6.

Also, twelve days later, in the breakout from the Anzio Beachhead, VI Corps artillery obtained complete domination of the battlefield.

Until the Gustave Line, north of Florence, had been reached, the Germans fought with such support as SPs, tanks, and 88s could give them and very little else. For the time being the great artillery battle had been won.

Certain artillery lessons from the succesful twin offensives are worth noting in detail.

When the possibility of surprise exists, counter-intelligence measures may yield good results.

". . . After D-day had been decided upon, a program of reconnaissance for position areas, with the necessary survey, was begun. Each group and separate battalion was given its area, together with a schedule for its preparation. Position areas were selected and prepared before any movement into position was made. During darkness for several weeks prior to D-day the battalions moved into positions a few at a time, being careful that daylight found them camouflaged and dug in. In many cases dummy guns with fairly complete installations were left in the bivouac areas to further the deception. Registration was restricted so that there would be no general increase in the fire in the sector but was so arranged that it was completed prior to the attack. The divisional artillery of the II Corps and the C.E.F. had been engaged for some time, as well as some additional corps battalions, so this registration worked in conjunction with theirs, thereby making it difficult for the enemy to appreciate the presence of the additional artillery. The habit of registration at last light had been established so when the additional battalions did this on the evening of the attack no change in routine was apparent."—Army Ground Force Board Report, 22 May 44, p. 1.

In contrast to this "silent policy" on the Main Front, on the Beachhead the opposite course was followed. All guns at Anzio had fired defensive concentrations against the major German threats to the Beachhead in mid February and early March, and the enemy, looking down from the hills almost into the muzzles of our guns, had an excellent idea of how much artillery we had. Accordingly, TOTs (simultaneous concentrations from all guns with the corps) were fired on positions and gun emplacements in first one direction and then another at odd hours of the day and night for over a week prior to D-day. At first, enemy reaction was very marked. It gradually fell off in intensity until 23 May, when the attack jumped off to a highly favorable start.

On the two fronts, then, diametrically opposite means were employed to achieve the same result: SURPRISE.

Another important factor in preparing a breakthrough is knowledge of enemy locations, by exploitation of all artillery intelligence agencies. Location in those outlined above included enemy batteries, mortars, CPs, assembly areas, routes of supply definitely known to be used, and a comprehensive outline of the enemy defensive works. The outstanding feature of both attacks was that only *known* locations were attacked, not localities which looked inviting on the map.

Another feature was organization of observation in advance. This was carefully regulated for all observation agencies, from high performance aircraft down to forward observers, to ensure that all sectors were covered and that unnecessary crowding of good OP cites was avoided.

Routes and positions within and without division boundaries were allotted with the general plan in view.

Finally, fire plans were flexible enough to provide for unforeseen contingencies. The weather just prior to the breakout from Anzio was such that the air support planned was curtailed at the last minute. The artillery was called upon to make good the deficiency, and did.

Centralized Artillery Fire in the Defensive

Well-planned defensive fires are credited with having saved the Anzio Beachhead during its precarious early days. Every field artillery piece in the VI Corps was tied to a common grid and could be fired on a prearranged concentration in any sector on the whole perimeter of the beachhead by the broadcasting of a single code word. On 17 Feb some 2,500 German infantry were seen moving south on the Albano—Anzio road south of Carroceto, by the Air OP Officer of 45th Division Artillery. Within 12 minutes the massed fire of all the corps artillery was placed on a short stretch of the road, and within the next 50 minutes was shifted to four other locations by the Air OP observer. These fires stopped the attack.

On a later occasion equally prompt and heavy concentrations were brought down on a second great German thrust, launched from Cisterna. These massed fires contributed materially to stopping this attack.

In discussing the defensive use of artillery under centralized control, the importance of medium and heavy artillery in breaking up tank attacks deserves special mention. Before attacking, tanks must rendezvous in final assembly areas near the front for last minute conferences, checking of materiel, and assumption of combat formations. Here artillery fire is most effective in dislocating enemy plans and upsetting his time schedules. Light artillery does little damage to enemy armor in action. Indeed, our tanks operate under our own time fire. Light artillery does force enemy crews to button up and reduces their efficiency somewhat, and divorces the tanks from their accompanying infantry. Destruction of enemy tanks by medium and heavy artillery in the Mediterranean Theater has probably been exceeded only by the Tank Destroyers, and is believed to be commensurate with that obtained by mines, infantry weapons, and air action combined.

An early instance of the value of long-range, heavy artillery in antitank defense was furnished in Tunisia. Part of the 1st Battalion, 36th Field Artillery Regiment, was in position behind the 1st Infantry Division CP near El Guettar. The 10th Panzer Division, which had won fame in Poland, was known to be in the vicinity. Light artillery passed back warn-

ing of an enemy armored thrust. A very inexperienced OCS graduate, who had joined the battalion 10 days earlier, was

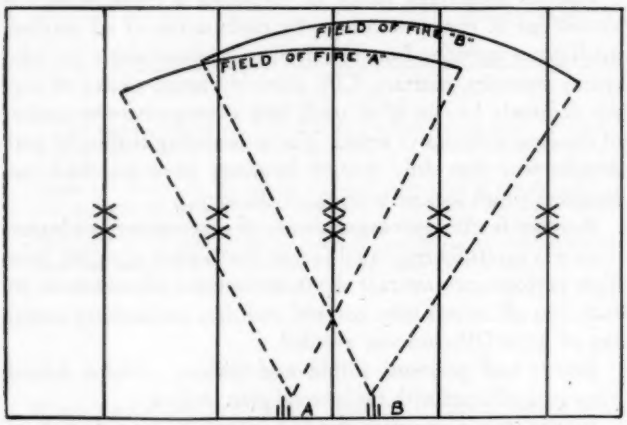


Figure 1. Intersection of fields of fire with large unit boundaries.

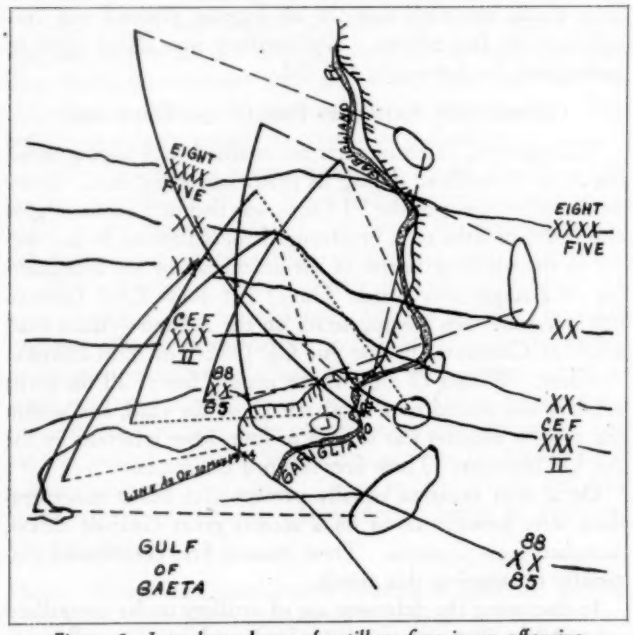


Figure 2. Interdependence of artillery fires in an offensive.

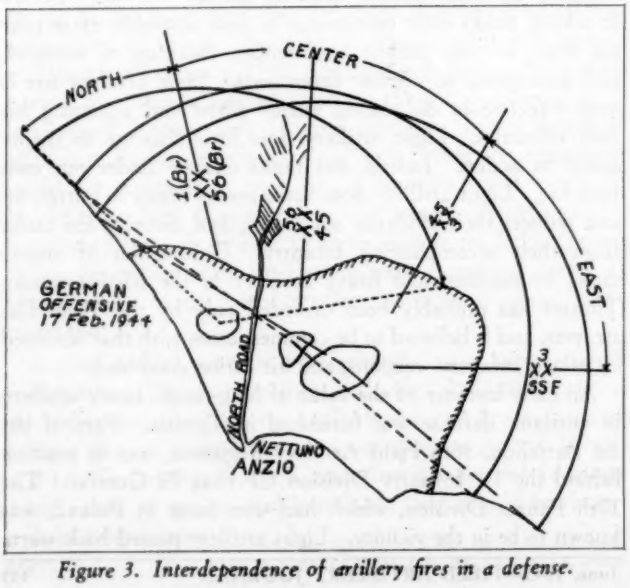


Figure 3. Interdependence of artillery fires in a defense.

observing from a hill south of El Guettar. At about 20,000 yards he saw numerous large German tanks approaching on a long oblique. The battery he was firing fired a little better than a round per gun per minute for an hour. Minimum range for three of the guns was 9,000 yards. The tanks came on past this range, with the remaining gun still blasting away at 7,000 yards from the battery position. They were within 2,000 yards of General Terry Allen's CP. At that point they decided that they had had enough, and started to withdraw. At 9,000 yards the observer fired his full battery again. When the Panzers finally got out of range they could count five tanks missing, PzKw IVs and VIs.

This incident is mentioned to show that shells of large caliber scoring direct hits or near misses are effective against tanks. Adjustments of this sort are the exception, however, not the rule. Antitank fire by corps artillery units presents a close parallel to defensive counterbattery fire. Groups of concentrations on likely avenues and assembly areas are prepared to be fired on call. Scrutiny of daily photographic cover may reveal the assembly areas, or as at Anzio an impending attack may be seen from an Air OP. Enough fire is concentrated on the area in which the tanks are sitting or on a zone through which they must pass to produce destruction and damage. Under this type of attack the enemy tankmen can do nothing except withdraw. It is a constant overhanging threat and PWs have testified that they have an especial aversion to the sense of impotence it brings.

Technique of Centralized Control

We have seen how, in Tunisia and Sicily and during the earlier phases of the Italian Campaign, corps artillery was often employed in furthering the plans of division artillery commanders. We have seen how separate division fights gave way during the winter of 1943-44 to a type of fighting more closely approaching the Russian "war of fronts." Army and Corps Artillery Officers played extremely responsible roles, although they were constantly dealing on controversial matters with division commanders of higher grade.

Plans for "isolating the battlefield" before the breakthrough on the main front were coordinated at Army Headquarters, where the responsibilities of Air Force and Field Artillery were carefully defined. Of particular note is the fact that the Corps Artillery Commander at Anzio was the coordinating agency for all additional support, such as naval gunfire and air support. Corps Artillery Officers integrated divisional artillery fires in these offensive and defensive fire plans. Lateral liaison between Corps Artillery Officers on the Main Front resulted in placing fires in neighboring sectors, to thicken concentrations there or to deceive hostile counterbattery agencies. The importance of this measure is shown diagrammatically in Figure 1. Guns emplaced at "A" and "B" lose nearly half their effectiveness unless their fires cross division and corps boundaries.

Actual artillery position areas for the May offensive on the Garigliano and for the defense of the Anzio Beachhead are shown in Figures 2 and 3, to illustrate how much fire power would be lost were control not centralized.

While centralized control ensures maximum coverage of a given sector, the necessity for speed in answering fires makes it necessary to decentralize in moving situations, and to make certain classes of observed fires available on call.

The availability of corps artillery battalions and division general support battalions in a reinforcing role may be set up by corps order in the manner of the following table:

A STANDING OPERATING PROCEDURE FOR ARTILLERY WITH THE CORPS

Commanders have available the artillery indicated below, *except for a preparation or counterpreparation.*

Observed fires on targets of opportunity take precedence over prearranged fires.

Critical fires take precedence over other fires.

Except for counterpreparation, reinforcing Corps Artillery is available full time to reinforced unit for defensive fires.

AVAILABLE TO DIVISION

Division artillery (organic and attached)	Full time
Corps artillery in general support of corps with mission to reinforce division	½ time*
Corps artillery whose only mission is to reinforce division	Full time

AVAILABLE TO CORPS

Corps artillery in general support of corps with no mission to reinforce a division	Full time
Corps artillery in general support of Corps with mission to reinforce a division	½ time†

*For prearranged fires, use first 15 minutes in each half hour in the absence of other arrangements.

†For prearranged fires, use last 15 minutes in each half hour.

The following availability table may be used to facilitate rapid planning when Corps Artillery battalions or division general support battalions are given reinforcing missions:

AVAILABLE TO DIVISION

To Direct Support Artillery Battalion Commander	
Direct support artillery battalion	Full time
Division artillery in general support of division with mission to reinforce direct support battalion	½ time*
Division or Corps artillery battalion whose only mission is to reinforce direct support battalion	Full time
Corps artillery in general support of Corps with mission to reinforce direct support battalion	½ time*
To Division Artillery Commander	
Division artillery in general support of division with no mission to reinforce a direct support battalion	Full time
Division artillery in general support of division with mission to reinforce a direct support battalion	½ time†
Corps artillery whose only mission is to reinforce division artillery	Full time
Corps artillery in general support of Corps with mission to reinforce division artillery	½ time*

AVAILABLE TO CORPS

To Corps FDC	
Corps artillery in general support of Corps with no mission to reinforce a division	Full time
Corps artillery in general support of Corps with mission to reinforce a division	½ time†
Corps artillery whose only mission is to reinforce a division	Zero

*For prearranged fires, use first 15 minutes in each half hour in the absence of other arrangements.

†For prearranged fires, use last 15 minutes in each half hour.

Availability tables for a preparation or counterpreparation may be set up in still greater detail.

STANDING OPERATING PROCEDURE

ARTILLERY WITH THE ..... CORPS

Commanders have available *for a preparation or a counterpreparation* the artillery indicated below.

AVAILABLE TO DIVISION |///|

///|///|///	Division artillery (organic and attached) except medium artillery.
|///|///|	Division medium artillery.
///|///|///	Corps artillery whose only mission is to reinforce division.
||///|	Corps artillery in general support of Corps with mission to reinforce division.
Duration of preparation.	

AVAILABLE TO CORPS |///|

///|||	Division medium artillery.
///|///|///	Corps artillery in general support of Corps with no mission to reinforce a division.
///|///|	Corps artillery in general support of Corps with mission to reinforce a division.
|||	Corps artillery whose only mission is to reinforce a division.
Duration of preparation.	

The following availability table may be used to facilitate rapid planning *for the preparation or counterpreparation,* when desired.

AVAILABLE TO DIVISION |///|

Direct Support (*To direct support arty comdr*)

///|///|///	Direct support artillery battalion.
||///|	Division artillery in general support of division with mission to reinforce direct support battalion.
||///|	Corps artillery in general support of Corps with mission to reinforce direct support battalion.
///|///|///	Division or Corps artillery whose only mission is to reinforce direct support battalion.
Duration of preparation.	

General Support (*To division artillery comdr*)

|///|///|	Division artillery in general support of division with no mission to reinforce a direct support battalion.
|///||	Division artillery in general support of division with mission to reinforce a direct support battalion.
||///|	Corps artillery in general support of Corps with mission to reinforce division artillery.
///|///|///	Corps artillery whose only mission is to reinforce division artillery.
Duration of preparation.	

AVAILABLE TO CORPS |///|

To Corps FDC

///|||	Division medium artillery.
///|///|///	Corps artillery in general support of Corps with no mission to reinforce a division.
///|///|	Corps artillery in general support of Corps with mission to reinforce a division.
|||	Corps artillery whose only mission is to reinforce a division.
Duration of preparation.	

Duplication of fires by different echelons can be avoided by the establishment by corps (or, exceptionally, by army) of limiting or coordinating lines. The safety of Air OP planes in dangerous trajectory zones is equally a matter for corps coordination.

Allocations of materiel and ammunition made by the War Department are based on fixed days of supply for all calibers. This necessitates careful supervision of ammunition expenditures by all commanders. Whenever the supply of ammunition of a particular caliber becomes critical the tendency is to place a limit of expenditure of a fixed number of rounds per gun per day on all weapons of that caliber. This should be avoided as it tends to set a mark for each unit based on the ammunition available, without regard to the relative importance of the targets engaged in different sectors. As far as possible, ammunition expenditure should be controlled by issuing special instructions governing the attack of targets to meet each situa-

tion and, in critical instances, by centralizing the authority to fire.

Conclusion

In Poland and Northern France Stukas and Panzer Divisions won illusory renown. They caused a certain amount of ill-considered comment to the effect that, like the Macedonean phalanx, massed artillery was obsolete. Slowly, we have been learning since how wrong that viewpoint was.

The Mediterranean Theater was, as has often been pointed out, the proving ground for our modern army. There the importance of Air—Ground cooperation was established. The armor and infantry learned to work together. There, too, artillery fires were recognized as the framework of attack and the bulwark of resistance. Higher commanders found artillery the most powerful means at their disposal to influence the course of battle. Their artillery was more powerful, more mobile, more flexible than ever before. As a rider gathers his horse before a jump, before each major offensive or defensive effort commanders in the Mediterranean ensured full use of their artillery by centralized control.

T/Os & Es for FA as of 10 Apr 45

Higher Headquarters Batteries:

6-10-1	27 Sept 44—Inf Div
6-12	20 Oct 44—Group
6-20-1	20 Oct 44—Brig
6-50-1	20 Oct 44—Corps Arty
6-110-1	30 Sep 44—Cav Div
6-150-1	4 Nov 44—Mt Div
6-160-1	22 Nov 44—Armd Div
6-200-1	1 Aug 44—AB Div
6-200-1T	16 Dec 44—AB Div

Battalion Headquarters Batteries:

6-26	27 Sep 44—105-mm How
6-36	27 Sep 44—Medium
6-46	30 Sep 44—H-Dr
6-56	20 Oct 44—Hv
6-76	20 Feb 45—Obsn
6-86	10 Apr 45—Rocket
*6-156	4 May 43—Pk
6-166	22 Nov 44—Armd
*6-176	28 Jul 43—Pk, Trk-Dr
*6-186	4 Nov 44—Pk, Mt
*6-216	1 Aug 44—Prcht
*6-216T	16 Dec 44—Prcht
*6-226	1 Aug 44—Gli
*6-226T	16 Dec 44—Gli

*Combined Hqs and Hqs & Sv Btry.

Special Tables:

6-78S	31 Jan 44—Sound Ranging Plat
6-212S	18 Aug 43—AB Group
6-597S	20 Mar 44—240-mm How Btry, Immobile

Batteries:

6-27	27 Sep 44—105-mm How, Trk-Dr
6-37	15 Jul 43—155-mm How, 4.5-in G, Trk-Dr (Med Arty)
6-47	1 Apr 42—75-mm G, H-Dr
6-57	20 Oct 44—155-mm G, Trk-Dr Hv Arty)
6-67	20 Oct 44—8-in How, Trk-Dr (Hv Arty)
6-77	20 Feb 45—Obsn Btry
6-87	10 Apr 45—Rocket
6-97	18 Aug 43—240-mm How, Trk-Dr (Hv Arty)
6-117	30 Sep 44—75-mm Fld-How, H
6-127	29 Sep 43—155-mm G, SP
6-157	4 May 43—75-mm How, Pk
6-167	22 Nov 44—Armd
6-177	28 Jul 43—75-mm How, Pk, Trk-Dr
6-187	4 Nov 44—75-mm How, Pk, Mt
6-217	1 Aug 44—75-mm How, Prcht
6-217T	16 Dec 44—75-mm How, Prcht
6-218	1 Aug 44—AA and AT, Btry, Prcht
6-218T	16 Dec 44—AA and AT, Btry, Prcht
6-227	1 Aug 44—75-mm How, Gli
6-227T	16 Dec 44—75-mm How or 105-mm How, M3, Gli
6-327	20 Oct 44—105-mm How, Trac-Dr
6-337	27 Sep 44—155-mm How, 4.5-in G, Trac-Dr (Med Arty)
6-357	6 Feb 45—155-mm G, Trac-Dr (Hv Arty)
6-367	2 Jul 43—8-in How, Trac-Dr (Hv Arty)
6-397	18 Aug 43—240-mm How, 8-in G, Trac-Dr (Hv Arty)

Service Batteries:

6-29	27 Sep 44—105-mm How, Trk Dr
6-39	15 Jul 43—Med Arty, Trk-Dr
6-49	30 Sep 44—H-Dr
6-59	20 Oct 44—Hv Arty, Trk-Dr
6-89	10 Apr 45—Rocket
6-129	29 Sep 43—155-mm G, SP
6-169	22 Nov 44—Armd
6-329	20 Oct 44—105-mm How, Trac-Dr
6-339	27 Sep 44—Med Arty, Trac-Dr
6-359	6 Feb 45—Hv Arty, Trac-Dr

Medical Detachments:

6-10	27 Sep 44—Hq, Inf Div Arty
6-12	20 Oct 44—Group
†6-25	27 Sep 44—105-mm How, Trk-Dr
†6-35	15 Jul 43—Med Arty, Trk-Dr
6-45	1 Apr 42—H-Dr
†6-55	20 Oct 44—155-mm G, Trk-Dr
†6-65	20 Oct 44—8-in How, Trk-Dr
6-75	20 Feb 45—Obsn Bn
6-85	10 Apr 45—Rocket
†6-95	18 Aug 43—240-mm How, Trk-Dr
6-110	30 Sep 44—Hq, Cav Div Arty
6-115	30 Sep 44—H Arty
†6-125	29 Sep 43—155-mm G, SP
6-150	4 Nov 44—Hq, Mt Div Arty
6-155	4 May 43—Pk
6-160	22 Nov 44—Hq, Armd Div Arty
6-165	22 Nov 44—Armd Arty
6-175	28 Jul 44—Pk-Trk-Dr
6-185	4 Nov 44—Pk, Mt
6-200	1 Aug 44—Hq, AB Div Arty
6-200T	16 Dec 44—Hq, AB Div Arty
6-215	1 Aug 44—Prcht
6-215T	16 Dec 44—Prcht
6-225	1 Aug 44—Gli
6-225T	16 Dec 44—Gli
†6-325	20 Oct 44—105-mm How, Trac-Dr
†6-335	27 Sep 44—Med Arty, Trac-Dr
†6-355	6 Feb 45—155-mm G, Trac-Dr
†6-365	2 Jul 43—8-in How, Trac-Dr
†6-395	18 Aug 43—240-mm How, 8-in G, Trac-Dr

†Common T/O & E.

War Department Lubrication Orders are carried with your equipment to help that equipment. You have no difficulty in finding out when to lubricate and where to lubricate to keep your pieces in the firing line.

GARIGLIANO MISSION

By Scorpion Staff

Cassino looked like this when bombarded in March, and substantially the same when attacked as here described.

The Mission

This account concerns an Armored Field Artillery Battalion. It was one of those composing the 6th Field Artillery Group attached to the American II Corps. In March, 1944, this battalion was withdrawn from the Cassino sector and sent to Capua for rest and reorganization.

During the month of April, 1944, while the II Corps was preparing for the May 11th offensive of the Italian Campaign, it was desired to harass enemy communications and supply installations without revealing the location of artillery emplaced for the offensive. It was also desired to determine enemy counterbattery strength and reaction. This mission was particularly suited for the mobility of armored artillery.

Assignment of the Mission

Early in April the 6th Field Artillery Group was given this mission and was reinforced by a detachment of M-10s from a Tank Destroyer company. It was believed that the simultaneous fire from mixed calibers would serve to further confuse the enemy as to the nature of the American Artillery build-up. The Armored Artillery Battalion was to employ its M-4 tanks as well as its self-propelled 105-mm howitzers. This would give the German three calibers to puzzle over in his shellrep.

The 6th Field Artillery Group assigned this mission for 5- to 7-day periods alternating between its battalions. General position areas were given to the battalion commander. Positions were to be occupied and vacated during darkness. Ammunition expenditure per gun was limited to 60 rounds per night. Target designation by type and coordinates would be sent down daily from the Corps Artillery FDC. All firing was to be done at night.

The reason for the latter and the reason why emplaced artillery had to be so carefully guarded can be readily understood from a brief description of the terrain.

The Terrain

In the Corps sector the enemy had taken up a defensive line along high ridges on the north side of a wide river valley and roughly parallel thereto. The valley was practically featureless for miles, and remarkably free of any vegetation except grass and occasional trees. This gave the enemy unimpeded observation to the rear of our front lines for a distance of five to ten miles. Countermeasures in the form of artificial smoke, photocamouflage discipline, and rigid traffic control were employed. Nevertheless, the front lines had remained static for a sufficiently long period so that the enemy had accurate fire immediately available for any points of visible activity. Our bridgehead extending to the foot of these dominating hills ran across a marshland heavily mined by the enemy. It was linked to the south side of the river by temporary bridges whose life expectancy depended mostly on the fortunate dispersion factor in enemy artillery. It was particularly important, therefore, that our reconnaissance not reveal our intentions.

Mission Undertaken

Prior to reconnaissance the battalion commander had established the composition of the force to accomplish the mission. It was to consist of eight pieces: four M-7s (105-mm SP), two M-4s (75-mm), and two M-10s (3-in). The battery commander whose four M-7s were being used was placed in charge of the force and his kitchen and administrative facilities were to be used. Part of the battalion fire direction section was attached to him for his use, as well as a T-2 tank recovery vehicle, and an ambulance, M-3.

Reconnaissance and Selection of Position

Reconnaissance was made by the battalion commander and the battalion RO. Primary consideration was given to the location of friendly troops and installations, in view of the likelihood of enemy counterbattery fire. Position areas assigned offered selection of positions on both sides of the river, varying from the friendly outpost line of resistance to several thousand yards behind it. In width there was no limit except the Corps boundaries. From this welter of possibilities selection was made of twelve positions. Some were to be occupied by more than one gun and preferably by those of different caliber. Nightly rotation of position was part of the deception employed.

From the battalion commander's standpoint some of the problems incident to a standard occupation of position, such as cover and defilade, were non-existent. The composite battery was to march from the rear area under cover of darkness, complete its firing, and retire to the rear before daylight. On the other hand there were problems of a different sort. One of these concerned the large volume of traffic forced to travel on the limited road net at night due to the daylight observation of our forward areas by the enemy. Establishment of one-way roads and directional traffic flow over the few bridges during certain hours presented additional complications. Coupled with this was the fact that the low-lying land was treacherous, especially with any change in the weather. Therefore in gen-

eral positions were located proximate to some infrequently travelled, hard-surfaced lane allowing easy entrance and exit.

When the battalion commander had completed his selection the RO went forward with the battery commander to show him the positions. After viewing his positions the latter took forward his mine sweeping detail and determined which places he would occupy on which nights. This latter was subject to daily reconnaissance and recheck. The BC then made reconnaissance for a bivouac position beyond the range of enemy observation and yet close enough so that the night march would not be too long. This position was occupied 24 hours before the first night's firing.

All traffic moving in the area of enemy observation required a written pass which was obtainable only for certain types and numbers of vehicles. The only hardship this involved was that of foresight and planning. Passes were checked frequently at dispersal areas and fines for violations were both advertised and exacted. The main thing is that it worked, it was efficient, and it undoubtedly contributed a large part to the surprise of the coming offensive. It was, however, a factor to be considered in the planning of any operation.

The battery commander took selected personnel over the route and indicated positions to the chiefs of sections. Timing estimates had to be nearly exact to comply with clearance priorities at the bridges and other control points. Some positions originally selected were not occupied because of mines. The battalion had no losses from mines during the operations, although by mistake one of the other battalions occupied a mined position and detonated a mine.

Training for the Mission

While reconnaissance was taking place a refresher course in indirect fire was conducted for the members of the M-4 tank crews and their reliefs. Other elements of the force needed no preparation beyond the briefing before each night's mission. Facility in the use of the azimuth indicator and quadrant was gained rapidly. It was decided to use the dome light, and this of necessity required that the tank be buttoned up for blackout. The lack of a lighting device for the quadrant plus the necessity of maintaining a maximum rate of fire made other lighting expedients not practical. Unfortunately the problem of ventilation was not considered until later on in the course of the actual firing. When at that time one of the gunners collapsed from the fumes a paulin was rigged to cover the top of the tank and the hatch was left open.

Survey

Maps with a scale of 1:25,000 were available for the operation. Previous use of this map had acquainted us with its reliability. Using this map it would have been possible to have completed a survey by inspection, with a high degree of accuracy. Considering that the positions varied several thousand yards in width as well as in depth, permitting harassing coverage of the entire sector, such a survey might have been used to conserve time and effort. Since time permitted an instrument survey was undertaken.

Using dX-dY, the reconnaissance officer placed an orienting line in each of the positions that were to be used. Positions were numbered and the coordinates of the gun stakes recorded at the fire direction center. It was planned to have the pieces lay on a base angle and take shifts therefrom for various targets. The survey was run during daylight, and apart from its magnitude it introduced no unusual problems.

FDC and Communications

The fire direction center at the battery worked directly with that of the Corps Artillery. Telephone communication was established between Corps Artillery and the bivouac area from which the force was operating. All reports and assignments went directly from one FDC to the other.

Assigned to the composite battery was a section consisting of the assistant operations officer, HCO, VCO, radio operator and draftsman. This crew plotted and computed all the firing data in addition to being telephone central and the radio NCS. They moved into the bivouac area with the force and remained there throughout the operation.

It was usual to receive from Corps FDC in the course of the morning the target assignment for the evening's firing. This sheet would contain the true coordinate location and the nature of the target. Following receipt of this the battery commander and the assistant operations officer would confer on the gun positions best suited to reach the target and the number of guns and number of rounds per target, as well as the time the positions were to be occupied. The same gun might harass the same target from two different positions during the evening. Also incident thereto was the matter of varying range capacities and size of gun flash. (In certain cases positions were ramped to give the tanks full benefit of their range.) Because of the many positions it was generally possible to fire along the axis of all roads to be harassed. Fire could be massed on one target from eight different positions or eight different targets could be shot at once to confuse the Germans.

After the decision had been made and each section's mission for the evening decided, preparation of the data was begun. The data for each piece was recorded on a separate data sheet which would be given later to each section chief at the briefing. The fire commands, the number of rounds, and the time to commence fire were contained on this sheet. Also included were the base angle and shifts therefrom for each target, as well as the compass in case the base angle could not be used. Radio call signs were also put out at the briefing.

Reports by radio were to be used only for reporting enemy shellfire, friendly casualties, or damage to or failure of vehicles. A prearranged system to expedite these reports was used, including an arbitrary numerical increase in compass readings and such.

Occupation of Position

Following the briefing watches were synchronized to the second, thereby insuring massing of the fires with each change of position. After darkness the battery commander personally dispatched the vehicles at staggered intervals as per the prearranged time schedule.

As it neared the front line each section became more and more conscious of the noise of the vehicle in the complete quiet of the night. Instructions were to halt vehicles when the Germans shot up flares. The Germans did use flares but no reaction indicated detection of any vehicle on the road. On the OPLR the aiming stake lights were replaced by luminous buttons, which proved adequate. The M-10s were kept at a greater range from the enemy than the other vehicles due to their terrific flash as well as their greater range capacity. None of this firing and noise was appreciated by the infantry out posts.

German counterbattery fire was received. The fact that it was without adjustment and that it was placed on an installation remote from other installations was revealing. In view of the fact that the positions were occupied only long enough to complete the required firing before movement to the next, it was rare that counterbattery caught up with the guns before they moved. It did happen occasionally but fortunately no casualties were incurred despite some "close ones."

Conclusion

Speculation typical of that concerning unobserved fires arose as to the accuracy of this gun-and-run firing. There was a lot of satisfaction, therefore, in setting afire a target listed as an enemy ammunition dump. The fire was plainly visible from the firing position.

The spirit of the cannoneers and all concerned was high. The nightly trips had no aura of gay adventure about them, however. Everyone felt that he was contributing valuable information to the coming offensive, not that he was just counterbattery bait. In addition, the men knew that they were hurting Germans and softening up the front for the expected offensive. The other batteries of the battalion not engaged in the work were digging in firing positions across the Garigliano at night and getting set for May 11th.

It would be a pleasant conclusion to say that the Germans were successfully deceived as to our dispositions and intentions. This may have been true in certain respects, but rumor has it that documents later captured indicated that the Germans had evaluated these nightly missions fairly correctly. Apparently their appraisal led to no corrective action on their part, judging from the success of the American counterbattery after the attack started.

Although teamwork was a highly important ingredient, it is no slight to anyone who participated in the missions to emphasize the splendid work on the part of the individual battery commanders. Their exactitude in planning and supervising each operation was very important, and they in turn were much indebted to a smoothly functioning operations section under the guidance of the Assistant S-3. Our own pleasure at the success of these operations received a dividend in the great success of the May 11th offensive, which began the victorious march from the Garigliano to Rome.

ARTILLERY VS. A GERMAN BRIDGE

By Capt. Carl F. Maples

With the 35th Infantry in Germany: In the sector of the 35th Inf Div only one bridge (located at Hilfarth, Germany, and in the hands of the Germans) was of reinforced concrete construction. It was the last route of escape for Germans in Hilfarth and vicinity west of the Roer River. The possibility of capturing this bridge before the Germans could destroy it was foremost in the thoughts of the Division Commander. For several weeks prior to the attack across the Roer daily observation flights of the artillery cub planes kept an accurate check on the condition of the structure and the extent of its use by the Germans.

With the beginning of the Ninth Army attacks across the Roer River on Friday, 23 Feb 45, the following plan was devised by 35th DivArty (Brig. Gen. T. L. Futch), in order to deny the enemy use of the bridge, to prevent his demolishing it, and therefore to enable our forces to capture it undamaged. Beginning at 0245 on 23 Feb a harassing program of artillery fire was established. This plan called for harassing fire by one gun (British 25-pounder) of the 692nd FA Bn, attached to 35th DivArty, firing at the rate of one round per minute during the hours of darkness and one round each two minutes during daylight hours when observation by liaison plane was impossible. During the day one plane and observer was assigned the sole mission of observing the bridge with instructions to direct fire on the bridge even if only one man was observed in its vicinity.

Sunday night (25 Feb) marked the critical time when an attempt would be made to capture the bridge. While the harassing fire on the bridge fell at the rate of 60 rounds per hour, elements of the 1st Bn 134th Inf attacked the town of Hilfarth at 2000, and during the night pushed toward the bridge. At the same time elements of the 3d Bn 134th Inf maneuvered to outflank the bridge site.

Upon approaching the bridge site the infantry, through the direct support battalion, ordered the fire on the bridge to be lifted at 0600, 26 Feb. The bridge, upon which approximately 1,200 rounds of light ammunition had been fired, was captured along with 20 Germans who comprised the holding force and demolition party. It was found to be wired for demolition, but the wires had been destroyed by artillery fire and the Germans were unable to repair the damage under the constant shelling. No major damage had been inflicted, so after the rubble had been cleared troops and vehicles made immediate crossing. The bridge, classified as Class 40 and vital to movement across the Roer, had been saved. Reports by Prisoners of War verified that the artillery fire had not only denied the Germans the use of the bridge, but also prevented its destruction.

"GOVERNMENTS OF THE MAJOR FOREIGN POWERS"

The Department of Economics, Government, and History of the United States Military Academy has published several editions of the above book. It has had only a limited distribution in the past, but this year's revision is available through the Book Department, Command and General Staff School, Fort Leavenworth, Kansas, at $1.00.

This new edition is noteworthy in several respects. For one thing, the close cooperation of various government agencies has made it possible in most cases to carry the story down to the end of 1944. For another, proper emphasis is given to the power factor, armed force, which aspect of government has received only cursory attention in older standard texts in political science.

Great Britain, France, Italy, U.S.S.R., Germany, and Japan are the powers discussed. Maps and charts supplement the text. A classified bibliography will greatly help those desiring more detailed information.

FORMOSA

By Col. Conrad H. Lanza

Formosa ("Taiwan" in both Chinese and Japanese) is an elongated island not quite 250 miles long from north to south and with a maximum width of 94 miles. The mean width of the main part of the island is about 70 miles. Area is slightly under 14,000 square miles.

Formosa lies about 225 miles north of Luzon and 80 miles from the nearest Philippine island, Batan (not Bataan). Off the west coast of Formosa is China, only 90 to 140 miles away and so within easy sailing distance for junks.

Stretching northeastwardly from Formosa are the Ryukyu Retto, formerly known as the Loochoo Islands. These form a series of stepping stones spread over the 700 miles to the south Japanese island, Kyushu. The nearest of these intervening islands are within 50 miles of Formosa.

Topographically the west side of Formosa is a low plain not over 20 miles wide. In this plain are the principal cities, most of the inhabitants, and the main agricultural and industrial areas. It is well provided with roads and railroads. The latter are narrow gauge (same as in Japan) but are well built, equipped, and managed.

The center of the island is a mountain chain—rough, high, and densely wooded, with no good roads and no railroads crossing them. They are inhabited by a number of tribes, referred to as "the savages."

The east side has a fertile plain at the northeast—Giran. There is a cultivated valley along the center and south center of the east coast, bounded by the main mountain range on the west but separated from the coast by the parallel Taito mountain range. A good road all along the east side passes through that valley. It connects with the west side only at the north and south ends of the island.

This coast road is remarkable for its construction. For a considerable distance the mountains are close to the sea and rise in sheer precipices, the highest exceeding 3,300 feet. In these places the road is carved out of the side of the rock. A railroad through the central valley on the east side has no connection with the railroads on the west side.

In recent years the main mountain range has been resurveyed and found not to be so high as at one time supposed. But it is high, and a serious military obstacle. Starting at the north end, within 10 miles of the sea the mountains rise to elevations of some 3,600 feet. Forty miles further south they are 6,600 feet high. Sixty miles south they exceed 10,000 feet.

The two highest mountains are Mount Sylvia or Tsugitaka (12,895 feet) and Mount Morrison or Niitaka (12,959 feet). The latter is just above the Tropic of Cancer. Neither of these mountains is imposing, as they lie among a mass of other peaks rising to 10,000 and 11,000 feet. At the south end the mountains drop off. Forty miles from Cape Garambi they fall to 5,000 feet; twenty miles from the island tip they do not exceed 3,500 feet. They end in a remarkable limestone mass.

The Taito range has its highest elevation at slightly over 5,500 feet. The central portion of the range varies between 3,000 and 4,000 feet and the ends about 2,000 feet.

Toward the Pacific the mountains present steep slopes. Elevations of 10,000 feet and over occur within 15 to 20 miles of the coast. On this side the sea is deep off shore and affords scanty anchoring facilities. Streams are limited to mountain torrents. Ports are small and open. Landing beaches are available near Karenko and Taito.

On the west coast there is ample space for invasions.

Formosa's *climate* varies considerably, and sometimes within short distance. The northeast monsoon prevails from November to April, the southwest monsoon during the remainder of the year. The east coast is very rainy during the northeast monsoon, the west coast during the southwest monsoon. Both coasts receive heavy rains and high winds during typhoons. These storms are frequent in Formosa. They cause streams to go out of their banks, wash out bridges, roads, and railroads, and cause considerable damage. Typhoons may occur any time between July and November but the greater number pass over in August and September.

Temperatures in winter in the elevated areas sometimes fall to below 40° F. Snow is rare and limited to the upper mountain areas. Troops operating in winter in north Formosa need warm clothing and protection against continuous rains. Kirun

(or Keelung), a major port and base at the north tip of the island, is one of the wettest places in the world, with an average fall of 200 inches.

The *inhabitants* of Formosa, according to latest available Japanese census, number 5,609,000. About 200,000 are "savages" living in villages mostly in the mountains. Japanese number about a half million. The remainder are Chinese, nearly all on the west side of the island.

The "savages" consist of seven tribes with different languages and customs. They resemble Filipinos and are probably of the same origin. Like the Igorote tribes in Luzon the Formosan savages have been head hunters, and for the same reasons: heads are essential to certain religious rites, and are a proof of valor. Young men who have not secured a head are not favorably regarded by the girls and find it difficult to secure a wife.

This undesirable custom has led to a continuous war between the savages and the Chinese. Although Chinese have been in Formosa in small numbers since time immemorial, the first mass movement (which commenced in the 17th Century) was resented by the savages. The Chinese immigrants were generally of a low type, and to this day are largely degraded.

The savages raid Chinese towns to secure heads, leaving the body wherever it might fall. The Chinese retaliate by cutting off heads of savages taken prisoner.

The Japanese have forbidden Chinese publications in Formosa. All newspapers are Japanese. Schools are general for both Chinese and savages, and by this time a knowledge of the Japanese language is common. With minor exceptions education is limited to basic studies.

On the west side of the mountain range is a Guard Line with posts about every quarter mile. Posts are of the Cossack type, not exceeding 4 men, one of whom is continuously on watch. Platoon and higher headquarters have the usual supply and administrative services. Duty of the Guard Line is to prevent savages from crossing it to the west or Chinese to the east, except as specially authorized for legitimate purposes. This Guard Line has reduced but not completely stopped the head hunting business. Some savages have been induced to substitute monkey heads for human heads for their religious rites. This change has been found to work in some districts, as the supply of monkeys is ample.

Formosa's *economic value* is considerable. The Chinese are industrious farmers, and the whole west side of the island is well cultivated. Since Japanese occupation agriculture has been improved. Rice and sugar are normally exported, most in recent years going to Japan. Tea is raised in large quantities; it usually went largely to the United States and British possessions.

The special product of the island is camphor, which has been supplied to the entire world. Camphor trees are found in the mountains. Annually about 10,000 of them have been chopped down. The wood is cut into chips, which are distilled in water to form camphor and camphor oil. Main production is at Taihoku, where the government has a practical monopoly with the mission of establishing satisfactory standards of quality and fair prices. The camphor trees are mainly in savage territory. Workers are mostly Chinese. These working parties are a source of supply to head hunters, and habitually are furnished with guards.

Opium is raised. Its consumption among the Chinese is general. Addicts use an average of 37 grains a day.

Ample crops of vegetables, potatoes (or yams), and tropical fruits are raised for local use.

North Sector

This really faces northeast and thus receives the full force of the northeast monsoon. It is 30 miles long. At its center is Keelung (pop. 84,978), a first class port and naval base. From here to Nagasaki is 628 miles; to Yokohama, 1,245 miles. This is the major base nearest to Japan from the south.

Keelung is an excellent harbor, usable by the largest ships. The entrance is bordered by wooded hills on top of which are numerous batteries having plunging fire on ships. As the harbor and approaches are restricted in width, they are unsuitable if the enemy has air superiority. If air superiority remains with us, this is the best harbor in Formosa. On shore there are ample facilities for a base.

Numerous canals traverse the city, similar to Manila, and permit cascos, sampans, and similar light craft to transport loads directly from ships to warehouses within the town.

Parallel to the north shore and only 5 to 10 miles away is a mountain range with elevations of about 3,500 feet, which cover the approach to the base from the south. There is a narrow coastal plain. Several villages east and west of Keelung permit debarkation in fair weather. A good road borders the entire coast. Gold and coal are found in the hills.

Keelung was occupied by French forces in 1884 and 1885. The Chinese do not seem ever to have had effective control of this area.

West Sector

From Keelung a road and a railroad go southeast 18 miles to Taihoku, which is the capital of Formosa (pop. 278,446). It lies on the Tansui River, which flows northwest to the port of Tansui. The railroad crosses through the mountains in four tunnels, the longest being over 1,800 feet long. The road winds over the mountains.

Taihoku, at an elevation of 120 feet, was a Chinese city. Four-fifths of the people still are Chinese; they live in a separate section. Japan has modernized Taihoku, which is well equipped with public buildings. There are good parks, wide streets, botanical gardens, hotels. It is entirely suited for an administrative and rest area.

The surrounding country is a broad, level plain extending west to the sea. The foothills of the main mountain range are just to the east, and are (except for a small area adjacent to the city) within the limits assigned to the savages. The latter are free to visit Taihoku and trade there. Their nearest village is 5 miles away.

Tansui is 12 miles by rail from Taihoku. It used to be the port for north Formosa but has been superseded by Keelung. A good road connects Tansui and Taihoku. Water transportation by the river is available, but is now of little importance. Tansui is a Chinese town, with the usual filth and evil smells. Otherwise it occupies a desirable location overlooking the river and sea. The immediate surrounding country is mostly rice paddies. The coast road extends north to Keelung. There is also a cross road over the mountains from the Tansui valley halfway between Taihoku and Tansui. With the main road south from Keelung this makes three roads from the north sector to the Tansui valley which with the railroad are available for military operations.

On the west side of Formosa the coast road starts south from Taihoku and is not always adjacent to the shore. It is

closely paralleled by the railroad. At outbreak of war the railroad was in good shape and well equipped, including dining cars, and with inns suitable for whites at the principal towns. All were run by Japs. Chinese have separate accommodations.

South of Taihoku the country is a tree-dotted plain with numerous small lakes and villages. Landings could be made at many points along the coast. During the season of the northeast monsoon the surf is lower. The local department (prefecture in Japanese) is Toen, whose capital of the same name is 18 miles from Taihoku. Next prefecture to the south is Shinchiku, with capital (again of the same name) near the north boundary. Just north of the town are the Hozan and Tozen Rivers, which during the wet season are at times deep and wide. Their mouths are close together and form a delta. This extends only 6 miles inland. Between the head of the delta and the Central Mountain Range are 15 miles of cultivated country. Shinchiku is 4 miles inland. South of this city the main railroad and coast road are usually within that distance of the shore.

18 miles south of Shinchiku is Byoritsu. Near this place are numerous oil wells. Prior to the current war these were not much developed. It is possible that they may now be a source of supply for the local Japanese garrison. The railroad and main road fork just north of Byoritsu. Closely following the sea, both have a route which has been constructed recently. The older road and railroad incline inland. From the Byoritsu Junction south for 70 miles to Nisui Jnc. there are two railroads and two good roads parallel to the coast.

The inland railroad has steep grades and long tunnels and bridges, and could be easily interrupted by air attacks. In the first 20 miles from Byoritsu there are 9 tunnels (of which two are more than 4,000 feet long) and numerous bridges (including one over the Taian River 1,660 feet long and another 1,250 feet long).

A hundred miles south of Taihoku is Taichu (pop. about 50,000), capital of the similarly named prefecture. This is a thriving commercial town. The adjacent country is a flat valley between the Central Mountain Range on the east and a small line of hills on the west. Much rice is raised, and considerable indigo and tobacco. Seven miles to the west is the small port of Rokko, used in the junk trade to China. The railroad and road from Taichu extend to Rokko, passing through Shoka, a Chinese town noted for its stenches.

The railroad and road from Byoritsu Junction also run to Shoka, having closely followed the sea. Due to its few grades this route is preferable for traffic purposes. On it are the small ports of Koryu, Taiko, and Kiyomizu, with intervening villages and beaches. Taiko lies between two deltas, Tainan to the north and Taiko to the south. Except for these restricted areas the entire coast can be landed over.

From Shoka the main railroad and road extend south 60 miles to Kagi. There are an alternate road and railroad from Taichu over a low range (30 miles) to Nisui Junction. From that point to Kagi there is only one through railroad, but there are two good parallel roads about 10 miles apart. The alternate road is closer to the sea and is paralleled by a railroad, which has one break at the Seira River. It is possible that this has been closed as a war measure. The main railroad and roads extend through sugar and rice fields, there being no important military obstacles.

Below Nisui Jnc. the railroad crosses the Seira River on a bridge over 2,900 feet long.

Kagi (pop. 72,984), capital of Kagi prefecture, is the principal city of this part of Formosa. It has a small port at Toseki, 20 miles to the west, with road and railroad connections. Sugar plantations cover most of the neighboring area. Ten miles south of Toseki is another small harbor—Hotei, with separate rail connection to Kagi. Both these ports are suitable for light traffic and could be useful as temporary bases.

Tainan (pop. 230,000) is the capital of the same name prefecture and the principal commercial city in south Formosa. It is 200 miles by rail from Taihoku. The railroad from Kagi reaches it in a 38-mile stretch over flat, cultivated, intervening country filled with small Chinese villages. There are two roads. The coast south of Toseki can be landed on but during the southwest monsoon the sea swell is high and small boats are hard to handle.

Tainan has a good port at Anping, which is adjacent, with roads and railroads. It is suitable for a minor base. The main city is surrounded by walls 20 feet high and 1¼ miles on each side. Experience has shown that walled Chinese cities can be defended by a street and house battle which may last a considerable time.

Thirty miles south of Tainan is Takao (pop. 83,735), which is a major naval and air base. The harbor is protected by breakwaters. Piers and a small drydock and unloading facilities are connected by railroad tracks and provided with extensive warehouses. Takao has good administrative buildings and Japanese hotels.

Ten miles east of Takao is the Katansui River, flowing nearly south at the base of the Central Mountain Range. This river, not fordable in this sector, limits deployments to the space between it and the sea. Its mouth is 12 miles southeast of Takao. An invasion landing south of Takao will find a double beach for more than half the distance to the Katansui, separated from each other by water that is shallow but not fordable. Best landing places are north of Takao, which would at the same time threaten the main enemy line of communications, which is the road and railroad from Tainan.

Takao, 229 miles from Taihoku, is the terminal of the railroad. A beginning has been made to extend the line further south to the tip of Formosa, thence up the east coast. This new line goes at first directly east and crosses the Katansui 12 miles above its mouth. It then turns south, following the east bank and the sea to the small village of Horyo on the coast. In an air line this is 27 miles from Takao. Beyond this town the coast road extends clear around the island.

South Sector

At the extreme south there is a partially sheltered bay and town at Kontei, 55 miles in an air line from Takao. It is not suitable for invasion purposes. 35 miles eastward is Kotosho Island (also known as Botel Tobago). This island is very hilly, it being really a large rock 1,500 to 1,800 feet high, 8 miles long from northwest to southeast, and half that wide. There is space for an airfield and it may sometime be useful for this purpose. The inhabitants are part of the savage tribes but appear to be very similar to the Filipinos of north Luzon.

East Sector

Fifty miles from the south cape is Taito, a small town and port. The intervening coast is a narrow coastal plain with no communications across the mountains, which rise steeply. At Taito is the mouth of the Pinan River. This flows south for 20 miles to turn east to enter the sea at Taito. The 20-mile

valley is only 10 miles from the Pacific, but is separated from it by the Taito Mountains (4,000 to 5,000 feet high). Just beyond the 20-mile valley across an almost imperceptible divide rises the Shukoran River, which flows north, extending the valley another 25 miles to the Tropic of Cancer, where the Shukoran turns east and through a break in the Taito Mountains reaches the sea at Taokoku. The valley extends north, however. A branch of the Shukoran flowing south accounts for the first 5 miles. Then across another divide are the headwaters of the Karoran River, which goes north and enters the sea around the end of the Taito Mountains at Karenko.

This succession of valleys, 10 miles inland, has a railroad and the coastal road throughout its total length of 80 miles. The inhabitants are "savages" and the area has little economic importance. As there are no routes across the mountains the area has restricted military importance. At the north and south ends are the two small ports of Taito and Karenko, 75 miles apart by sea. On the east side of the Taito Mountains, close to the ocean, is a good road from Taito to Taikanko. Beyond there is no road, the Taito Mountains rising nearly sheer from the sea.

North of Karenko the coast extends 45 miles to Suo, a small port and the railhead for a railroad to Keelung. Just beyond is the Giran plain, well cultivated and with several towns and villages. The Giran section is a possible invasion area. There is a direct road across the mountains to Taihoku (only 25 miles inland) in addition to the coast road and railroad which follow the shore to Keelung. A landing in Giran threatens both these northern major objectives. The surf is likely to be heavy during the northeast monsoon.

COMMENTS

Formosa is an excellent stepping stone from the Philippines toward Japan. Its west coast affords unlimited possibilities for airfields among its wide cultivated plains. Keelung and Takao are first class possibilities for naval bases. There is ample space on Formosa to assemble any number of troops and to establish as many depots and bases as desired.

The island is self-supporting as to food. None need be imported for local use, although certain kinds of food may be desirable.

The inhabitants are not likely to oppose an invasion by Allied troops. The Chinese do not like the Japanese, and the savages would probably not care who replaced their present masters.

Formosa has been little visited by the white races, and rarely by Americans. A very few Americans interested in tea, oil, and tobacco —the first as buyers and the latter two as sellers—have been doing business for 40 years in Taihoku and occasionally in Tainan and Takao. The natives are not very familiar with Americans, and until recently the Chinese in some of the cities were distinctly unfriendly.

Assuming that the Japanese provide a large garrison, a protracted campaign may be necessary to subdue them. This is likely to be fought in the long west plain, which is the only suitable location for maneuvers. The invasion has a choice of entering the west plain by landing either at the north or south ends, or somewhere in between.

Seizure of Keelung in the north would at once interfere with communications with Japan. Seizure of Takao would not so interfere, and would enable the Japanese to fight backward for over 200 miles.

As long as Japan holds the China coast, overnight transportation by motor boats and transport planes between China and Formosa is possible and probably could not be completely prevented. Recent reports indicate that Japan has been developing her harbors and airfields in China, just opposite Formosa, with a view to facilitating communications.

The complete conquest of Formosa is not necessarily a prerequisite to an invasion of Japan. It may suffice to merely establish a base. The Keelung and Taihoku area is the most suitable and would in itself present sufficient facilities for a major base. If the enemy continued to hold temporarily the rest of Formosa, the base would need to be covered from attack from the south. Keelung is covered from the south by a low mountain range. Taihoku has no natural protective line along the west coast; this would have to be held by mobile troops.

If Formosa is to become a base for the invasion of China rather than of Japan, seizure of the south ports and cities of Takao and Tainan, as well as of Keelung and Taihoku in the north, is indicated. In this case the intervening area might be left temporarily in enemy possession. It would probably be simpler to clear it as soon as time permits.

For an invasion the small ports of west Formosa would be useful, as from them landing craft can be loaded and dispatched. The distance straight across Formosa Strait would average about 100 miles. For such a short traverse bad weather can be avoided and crossings made only under favorable conditions. In this case the clearing of the west Formosa plain would simplify military operations.

ARTILLERY IN WOODED SWAMPS

By Maj. A. Zapadov

BY RADIO FROM MOSCOW, DIRECTLY TO THIS *JOURNAL*

Movement of artillery in wooded swamps inevitably involves many complications. Good roads are rare, so very often a number of units have to use the same highway. In most cases the enemy, retreating along this same road, jams it with felled trees and destroys bridges and the road surface to delay our advance. Bringing up artillery and preparing firing positions requires considerable time. Therefore in many instances the only way to rout the enemy is to bypass his strong points and attack them from the flanks and rear.

It is in such rugged terrain that small mobile units have to breech the defenses for the main force. Artillerymen have a particularly arduous task to perform: following in the wake of the infantry they have to overcome not only woodland but also rivers and swampy banks. Heavier duties naturally fall to battalion, regimental, and sometimes divisional artillery and heavy mortars, which are generally ferried across rivers with the advance units on rafts or other means available on the spot. Here are a number of instances.

Toward the close of the third day of an offensive, advance detachments of a Soviet infantry division were pinned to the ground by machine gun and mortar fire from a swamp-bordered river bank near a village. "Shots" taken by reconnaissance pilots showed this to be an enemy defense line with five strongpoints. The division commander decided to attack one of them. The area was carefully reconnoitered. Meanwhile the artillery, which had had to repair the road the enemy had rendered impassable, began to arrive. As its guns were emplaced in woods, hundreds of square yards in front of them had to be cleared of trees; this job was done by the gun crews. A number of pieces were pulled up to forward positions for

Russia has mounted a recent model of its 152-mm howitzer in its KV (heavy) tank. Here a pair of these machines are seen fording a river on the Second Baltic Front in Latvia.

direct fire. A road across the swamp, shown on the map, proved impassable for artillery. Gunners built a corduroy road several kilometers long, and after five hours of strenuous effort succeeded in rolling eight guns across, which they posted 300 meters from the front-line defenses. Believing the swamps impassable, the enemy found himself totally unprepared to meet our artillery assault.

These eight gun crews were given the mission of reducing enemy strongpoints. A preparation was begun simultaneously by mortars and batteries against pill-boxes and trenches. But the attempted attack proved those measures to be insufficient. Many new targets, previously unspotted, were located. The battle's outcome was determined by bringing up heavy artillery. These batteries pounded the enemy trenches, completing the rout started by the gunners using direct fire. Unable to withstand the terrific bombardment the enemy began to retreat, with our artillery inflicting heavy casualties on the routes of withdrawal.

In another sector an infantry regiment encountered strong enemy positions after a 14-kilometer march. It was not difficult to spot the firing points, for the enemy was very active. Defenses were found to be strongly fortified.

The enemy fire had to be silenced without delay, otherwise the Germans might be reinforced and our advance would slow down. After reconnoitering the area and acquainting himself with the system of enemy defenses, Capt. Ponkratov of the Guards picked firing positions for his guns right before the enemy lines. Artillerymen corduroyed the swamps and hauled three 75-mm and two 45-mm guns across for direct fire. For 20 minutes the gunners pounded the previously spotted targets, blasting firing points and trenches. After this artillery preparation conducted from open positions, the village was captured by an attack from three sides.

Following this, the infantry continued to advance with the artillery following closely. Richer for their battle experience in the forests, the crews employed simple devices to speed up the movement of their guns. Thus, the gunners moving with infantry always carried mats made of fagots and boards for movement across swamps, 50 yards of rope per gun, and blocks. With the aid of these blocks the crews dragged their pieces across bogs and lowered them down steep river banks. All these primitive devices proved very effective.

During a march an artillery unit sends officer observers with radios with the advanced infantry units outflanking the enemy, and then conducts fire as soon as it gets within range. The unit moves in the wake of the advanced detachment, keeping close radio touch with the observers.

One infantry regiment was ordered to penetrate to the enemy rear and seize a highway there. Its path lay through wooded areas and bogs without a single highway. Besides their rifles, tommy guns, and machine guns, the infantry could carry only 82-mm mortars. The artillery made slow headway; it was unable to reach the sector in time to take part in the operation. The forward observer party, headed by Lt. Shvidenko, was despatched to the enemy rear with the infantry.

The rifle regiment penetrated the enemy rear and seized the above-mentioned road. Deprived of their only escape route, the Germans undertook a number of counterattacks which were successfully beaten off. An attempt to get in touch with the artillery regiment failed at first, but when the artillery was in position contact was renewed and the batteries immediately took under fire targets indicated by the spotters and the infantry commander. The infantrymen, who by then had repelled ten counterthrusts, were running short of ammunition. The struggle was continued by the artillery, who in 12 hours repulsed 18 counterattacks.

Despite the difficulty of movement, many maneuvers were accomplished by large artillery units. Once an artillery unit operating on the right flank of an army on the offensive found Germans putting up stubborn resistance on the left flank, and immediately transferred its batteries to the latter sector. In 24 hours the unit traversed 70 kilometers on damaged roads. Blown-up bridges took the gunners many kilometers out of their way.

Later, after a further advance of a hundred kilometers, Soviet troops encountered resistance from enemy established in defenses previously built. Without artillery support further progress was impossible. And the artillery units again marched 150 kilometers under very trying conditions, covering the distance in 48 hours.

HOW ARTILLERY CAPTURED A TOWN

By Col. Boris Samoilov

BY RADIO FROM MOSCOW, DIRECTLY TO THIS *JOURNAL*

In the artillery branch of the Red Army are special antitank units. With concentrated fire they have systematically shattered the enemy's attacks and counterattacks.

Against enemy armor these weapons bring to bear their shells' penetrating power. Against tanks' mobility they use their rapidity of fire and swift movement from position to position. Soviet antitank artillery fully possesses these qualities: its shells can penetrate 200 mm of armor and each gun is drawn by fast prime-movers able to negotiate any terrain.

Antitank guns generally coordinate their actions with all arms of the service, particularly with infantry. Though these batteries are extremely mobile and can fire very rapidly, the guns are served by no more than four or five men each and therefore require the infantry's protection. On occasion, however, such artillery has been compelled to act independently: in one case an antitank gun brigade captured a town and held the place for two hours, until the infantry arrived; this occurred in 1943, when the Red Army was conducting its offensive operations on the right bank of the Dnieper.

Pursuing the Germans, units of a Soviet infantry corps had been assigned the mission of seizing the town of Skvir, southwest of Kiev. Two regiments of an artillery brigade moved with the infantry, their guns porteed. The enemy fell back upon previously prepared positions on the northern outskirts of Skvir. His tanks were withdrawing to the city from the south.

It was important to capture the town before it could be reached by the German tanks, or at any rate to block the latter and thereby facilitate matters for the advancing infantry. Guided by this, the commander of the antitank brigade decided to penetrate the town on the heels of the retreating

enemy, to capture the place and prepare for the defense of its southern approaches. This plan was worked out in conjunction with the commander of the infantry corps, and fitted to the actions of the infantry units advancing on the city from the north.

Then the commander of the AT brigade ordered the commander of one artillery regiment to overtake the infantry with two of his batteries, deploy on the northern outskirts of the town, and rake the streets and crossings with fire. The commander of the second regiment was also to overtake the infantry with two batteries, deploy on the left of the road leading into town from the north, and rake the northwestern edge. In addition, both regiments were to assign two batteries each for the purpose of swiftly penetrating the town, there to occupy requisite positions at street intersections and shell the streets and alleys.

Within 30 minutes four batteries had overtaken the infantry, deployed at the town's northern edge, and opened fire on the enemy's infantry, just then settling in their trenches. A barrage was maintained for six or eight minutes. The enemy was taken aback by the daring of our artillerymen and so couldn't hold out long. German guns failed to retaliate on time. By then four other batteries broke through to the town at high speed. At first the gunners swept the streets with tommy guns and showered the gardens and back yards with hand grenades. Quickly the Soviet guns gained the center of town, where they were uncoupled and began to shell the streets and various buildings held by the enemy.

Apprised of the enemy's disorderly retreat to the south, the brigade commander decided to remove his batteries from the northern and southern outskirts. Soon emplaced here, they shelled two roads leading into town from the south. When German tanks tried to penetrate the town they were met with intense fire. Two repeated tank attacks of the enemy proved equally futile. For two hours the Soviet gunners fought here alone. By that time the Red infantry was approaching from the north. They broke through and cleared Skvir of Germans.

Under the conditions that existed, the actions of the artillery were perfectly justified.

NIGHT AERIAL OBSERVATION

By Capt. William H. Kashner, FA, and Capt. Archibald M. Rodgers, FA

Considerable success has been experienced in employing air observers at night during action and under unfavorable conditions. The unfavorable conditions consisted of tropical, forest-covered terrain with mountains, typically temperamental tropical weather, and lack of experience in night observation missions on the part of both pilots and observers. Further, the aircraft employed were not designed or equipped for artillery observation.

For the most part PBY *Catalinas* were used, although TBF *Avengers* were also employed. The "Cats" could stay aloft from dark to daylight, but the *Avengers* had to be relieved at two- to four-hour intervals. The planes carried bombs and were also able to strafe. What information is available indicates that the bombs were effectively used. It was necessary that the operation of artillery spotter planes at night be carefully coordinated with Fighter Control and Air Operations.

The primary mission was counterbattery observation and the observers were experienced in daylight missions over the area of operations. Observers were supplied with air photos of a scale 1:60,000 and were briefed prior to takeoff. They found the photomaps with a point designation code excellent for their purposes. These maps were gridded contact prints of photos taken with a K-17 camera (6" focal length) at 30,000 feet. They were not only valuable in designating targets, but also of assistance in navigation because of the large area covered by just a few of these prints. Frequently the pilots were not well acquainted with the terrain features, so it was doubly desirable to send observers who knew the terrain features and had observed the area by daylight.

Communications difficulties were few under the circumstances. Observers had to relay messages to the radio operator. The latter being unfamiliar with artillery terminology, there were difficulties which could have been obviated had the artillery observer been his own radio operator.

There is a tendency to doubt that the observer at night can clearly distinguish targets. This is an erroneous impression, for a trained observer can readily distinguish gun flashes from shell bursts, and locate small arms fire directed toward the plane and concealed lights not totally covered. Experience is the only way to achieve the ability to pin-point targets on an air photo at night, but experienced observers had no difficulty. Initial target designations were made with no noticeable decrease in accuracy from daylight missions,[1] and adjustments proceeded with excellent results. Confidence of the gunnery officers in the observer, and careful designation and description of targets by the observer, are factors contributing materially to the rapid and effective adjustment of fire by night air observers.

Artillery muzzle flashes were distinctly seen by the observers at distances in excess of ten miles. Small arms fired at the plane can be pin-pointed, but when fired at ground targets small arms are difficult to locate. Artillery firing in the direction of the plane can always be seen. Shell bursts are gone so quickly at night when HE is used that sensing may be difficult, but smoke bursts in a shower of flame which persists and makes it easy to sense and almost impossible to lose at night.

The best observation was obtained at approximately 5,000 feet, dropping lower for a close search or a pin-point location. Normal ground haze greatly restricted the observer's field of view at lower altitudes. Dropping flares failed to prove of any assistance in observation. Successful observation was found to exist on clear, dark nights as well as during moonlight. Sometimes movement in open areas can be seen on a clear, dark night.

Enemy artillery seemed to make a practice of waiting until the plane was out of hearing before firing. Had the enemy closely followed this practice, it would have been difficult to obtain locations of enemy artillery. If the enemy were to closely adhere to such a policy, however, it would be possible to neutralize his artillery by simply maintaining aerial observation in the general area of his artillery positions.

[1] As a matter of fact, on one occasion the first round in adjustment was a target hit.

A Motor Officer's Guide

By Col. H. J. Crigger, FA

AUTHOR'S NOTE

Objectives of this article are to familiarize the new motor officer with the requirements of his job and the duties of associated personnel, and to aid him in understanding his work and its ramifications.

It is intended only as "a solution" and prescribes nothing that can not or will not be changed by situations or conditions. In most cases the commanding officer will designate what he wants from his motor officer. In some cases the position is assigned without definition; then this "guide" may be most useful.

Grateful acknowledgment is made to Lt. Col. L. H. Denison, Capt. G. W. Byrd, Jr., Capt. H. L. Minert, and Lt. H. L. Walder, all Department of Motors, Field Artillery School, whose excellent collaboration in compiling the necessary data made this article possible.

THE MOTOR OFFICER

Characteristics

Much of the results of a motor officer's work depend upon willing cooperation of his associates and men. Sources of supply, particularly, must be cultivated. This requires ability to meet people and impress them favorably. A pleasant personality is a prime requisite of the motor officer.

Completion of a course in an Army Service School for motor specialists should be one of the minimum requirements. A civilian background of work with automotive vehicles is helpful.

Abilities

Consistent with all precepts of good leadership, it is necessary that the motor officer be technically qualified in the work that he supervises. This is essential to the conduct of inspections and the solution of problems of repair or maintenance.

The ability to organize work and direct others is a basic requirement for a motor officer. He must be able to obtain the full cooperation of other officers, mechanics, drivers, and supply personnel. He must conduct training programs for officers and motor maintenance personnel. He must stimulate the respect for maintenance and its accomplishment. This is particularly difficult because he does not have direct control over most of the personnel involved and he must convince them of the value of his recommendations.

Duties of Battalion Motor Officer

Administrative

The battalion motor officer:

Is the technical advisor and assistant to the commander on matters pertaining to motor vehicles. He keeps the battalion commander informed of the maintenance situation, condition of vehicles, availability of parts and other supplies, efficiency and cooperation of subordinate units, and status of training of drivers and mechanics.

Assists the S-3 in formulation of training schedules so that preventive maintenance can be performed and all personnel receive the instruction and training prescribed by the Unit Training Program, Field Artillery.

Assists in planning for procurement of motors supplies and should keep the S-4 informed of the status of availability of parts in the organization.

Maintains liaison with higher echelon personnel and all battery commanders and motor officers.

Consolidates and coordinates the requests for higher echelon work from work orders originating in the batteries.

Consolidates requisitions for vehicle parts and supplies other than those handled by unit supply.

Aids in planning battalion motor marches (FM 25-10) and insures that all subordinate units are notified of the location of repair facilities in the field.

Selects or aids in the selection of personnel for maintenance sections and attendances at maintenance schools.

Disseminates to maintenance personnel all pertinent information issued in technical service bulletins, regulations, or other directives. Battery Commanders, Motor Officers, Motor Sergeants, and Drivers' Call; battalion, battery, and shop bulletins can be used.

Keeps a file of all reference material.

Maintains morale of maintenance personnel. A system of rewards for superior work should be used. Personal interest and frequent visits to maintenance installations are necessary.

Training

He also supervises and assists in training battery motor officers; motor sergeants, chiefs of section, and mechanics; drivers; motor supply and administrative personnel: administrative personnel must be trained to keep the prescribed reports and records as listed in AR 850-15; inspection teams.

Command

As a command function he takes charge of the battalion motor maintenance section, platoon, or company.

Supervisory

In a supervisory capacity he:

Supervises the maintenance, repair, and servicing of vehicles by the battalion maintenance section.

Ensures that subordinate units perform their normal echelon duties and all work possible consistent with nature of repairs; availability of parts, tools, and equipment; capabilities of personnel; and the situation.

Directs the battalion dispatch system. Dispatch systems are utilized to control the use of the correct type of vehicle for a task, consolidate errands and ensure that only qualified drivers operate vehicles.

Supervises operation of vehicles (driver practices); keeping of prescribed reports and records; type, condition, container labeling, and storage of all fuels and lubricants; and maintenance operations of the battalion and battery shops (spot checks all operations).

Inspections

An inspection is an examination to disclose the condition of a vehicle and the degree of compliance with established standards. Its purpose is to ensure operation, use, maintenance, and supply of vehicles to meet the needs of combat. These are of several types.

In command inspections the motor officer assists the commanding officer in making inspections, and he may suggest items to be inspected.

He performs inspections of organization vehicles and maintenance installations. In their course he:

Notes deficiencies in vehicle maintenance; use, condition, and storage of vehicle and shop tools (SNL G-27, Section 2); use, condition and storage of parts supply; use and condition of prescribed records and reports.

Ensures observation of proper safety and fire precautions (AR 850-15).

Makes inspections of vehicles in storage (AR 850-18).

Conducts or has a technical inspection made when there is a transfer of accountability (AR 850-15), to designate which vehicles require work beyond the scope of the using organization.

Reports on condition of vehicles are always important to a commander and become increasingly valuable when fixed repair installations become more distant.

Operational Matters

Arranges that all vehicles receive scheduled maintenance service.

Provides the supplies and parts needed for proper maintenance.

Holds regular meetings with motor officers and sergeants to solve maintenance problems.

Prevents and eliminates hoarding of parts.

Issues driver permits (TM 21-300), sets up driver tests and examines driver candidates in cooperation with battery motor officers. Practical tests are frequently administered by battery motor officers and a written test is given by the battalion motor officer.

Ensures that all drivers have been oriented before a march (drivers should know their destination); supervises march discipline, maintenance and repair.

Directs disposition of disabled vehicles: arranges for immediate repair or abandonment, directs roadside repairs or rescues, directs transfer of loads, orients and instructs personnel left with disabled vehicles.

Superintends maintenance to avoid or eliminate vehicles not regularly available for maintenance, drivers not accompanying vehicles, vehicle abuse because of poorly trained drivers, improper conception of time involved to perform proper maintenance service, insufficient tools and supplies.

Duties of Battery Motor Officer

Administrative

Acts as technical adviser and assistant to the battery commander on motor maintenance.

Training

Instructs and supervises instruction of maintenance personnel: motor sergeants, chiefs of section, and mechanics; drivers; supply and administrative personnel.

Supervisory

This includes maintenance, repair, and servicing by battery mechanics and drivers; vehicle operation; the keeping of prescribed forms and records; routine inspections; type, conditions, labeling, and storage of fuels and lubricants; shop practices; observation of safety and fire precautions.

Inspections

In this work he assists battery commander in making inspections; spot checks vehicle maintenance; scrutinizes use, condition, and storage of parts supply, and of shop and vehicle tools; watches the maintenance installation or area; and constantly observes driver practices.

Operational

Assists in performance of command inspections.

Trains drivers and conducts practical tests.

Rides at the tail of the column on marches and supervises repairs or disposition of disabled vehicles.

Procures supplies and parts for maintenance section.

OTHER MOTOR MAINTENANCE PERSONNEL

Commanders

For responsibility for maintenance see AR 850-15. Each commander having motor transportation under his control or within his jurisdiction is responsible for the operation and maintenance of the vehicles of his command. This is a command responsibility which cannot be shifted to subordinates. A commander organizes and trains his unit personnel to perform the prescribed maintenance operations and supervises the execution of their work by close personal observation and inspections.

The commander may delegate part of the supervision to qualified personnel, but such delegation to subordinates does not relieve the commander of his responsibility. The impetus for good maintenance must come from the commander. Vehicle condition is decidedly better in organizations commanded by officers who demonstrate interest in the performance of preventive maintenance.

The G-3 or S-3 controls the time allotted to various phases of the training and must consider the time required for maintenance service in arranging the program. The G-4 (S-4) procures parts and supplies and must work in conjunction with the motor officer to meet maintenance requirements. The commander of the 3d echelon maintenance unit is closely related to the commander's staff and may render advice on maintenance matters.

Among his duties, the Commanding Officer must:

Establish definite *responsibility* of motors personnel for each function of operation and maintenance.

Establish and maintain uniform and adequate *standards* for the operation and maintenance of vehicles. These standards should be flexible to meet varying conditions.

Assign drivers to each vehicle. Require that the assigned driver be the only one to drive a vehicle (except in an emergency) and that all drivers are properly qualified.

Make vehicles available for maintenance services, enforce scheduled maintenances, provide adequate personnel and the prescribed tools and equipment for those services.

Provide schools to train drivers and mechanics.

Require the keeping of prescribed forms and *records.*

Make inspections as necessary to insure proper functioning of all maintenance personnel. Although authority may be delegated to the motor officer, the presence of the commanding officer during an inspection stimulates operating efficiency and morale.

Supply Personnel

Regimental or battalion supply officer: Procures tools, equipment, and supplies for maintenance. Coordinates procurement of supplies. Informs the S-3 of the status of supplies available for training or operation. Confers with battalion motor officer to expedite solution of supply problems and keeps informed of quantity and condition of supplies on hand.

Battalion motor supply sergeant (when authorized): Learns the nomenclature of all 1st and 2nd echelon parts and replacements. Makes out and consolidates requisitions for fuels and lubricants. Keeps records of higher echelon work orders and job requests. Establishes contact with higher echelons, learns ordnance procedures, and maintains such relations with higher echelons' personnel as are needed to secure their cooperation. Keeps informed of current information published by the War Department Adjutant General's Office and the Ordnance Department.

Battalion motor supply corporal: Maintains stock of authorized parts. Consolidates requisitions and orders needed parts. Issues parts. Organizes parts bins and keeps accurate records of stock. Personally contacts ordnance and follows up vehicle repairs. Keeps informed of SNL's of spare parts and equipment. Keeps informed on ordnance procedures.

Battalion Motor Sergeant

This sergeant is in some ways the most important man to battalion motor maintenance. Frequently the motor officers are assigned other duties and all the duties of administration, supervision, and operation become the responsibility of the sergeant. He takes charge of the mechanics, assigns and supervises their work; coordinates the work of supply and maintenance personnel; supervises the preparation of records and reports; establishes the maintenance installation in the field and notifies subordinate units of its location. Among his duties, he assists in the selection, training, and organization of maintenance personnel; organizes and operates the battalion maintenance section; spot checks and inspects maintenance of battalion vehicles; reports to the motor officer on the condition of vehicles and efficiency of maintenance personnel; learns ordnance procedures; aids in supervision of all subordinate unit maintenance personnel; when situation requires, requisitions personnel and establishes facilities to expedite maintenance services in the field; substitutes for the motor officer.

Battery Motor Sergeant

This man must be prepared to carry on for the battery motor officer, supervising battery 2nd echelon and 1st echelon maintenance. He reports to battery motor officer and the battalion motor sergeant; assists in selection and training of battery maintenance personnel; sets up and operates the battery 2nd echelon maintenance detail; supervises and inspects 1st echelon maintenance; supervises keeping of battery maintenance records and reports; takes charge of the battery motor park.

Chiefs of Section

For responsibility for training see AR 850-15.

Each of these men is charged with assisting in the training and supervising of drivers in collaboration with the motor sergeant. Each should be trained to realize the problems of 1st echelon maintenance and taught to appreciate his responsibility for his vehicles, and should assign help to the driver when necessary to complete vehicle 1st echelon maintenance. He reports to the motor sergeant on the condition of vehicles and problems of 1st echelon maintenance.

Mechanics

Battalion motor mechanics perform the semiannual or monthly maintenance services on all battalion vehicles. They make adjustments, repairs, and replacements not performed by the battery and

make emergency repairs when possible or necessary. At least one mechanic should be trained to take the place of the battalion motor sergeant.

Battery motor mechanics perform the authorized battery maintenance services and other repairs consistent with personnel, tools, supplies, and equipment available and that the situation and time allow. One mechanic should be trained to substitute for the battery motor sergeant.

Drivers

Duties and training of drivers are described in TM 21-300, *Driver Selection and Training;* TM 21-301, *Driver Training, Half-Track and Full-Track Vehicles;* TM 21-305, *Drivers' Manual;* and TM 6-605, *Field Artillery Individual and Unit Training Standards.*

Forms with which the driver must be familiar are listed in AR 850-15.

MISCELLANEOUS INFORMATION FOR THE MOTOR OFFICER

Policies for the New Motor Officer

Learn all of the battalion and higher unit Standing Operating Procedures, giving special attention to marches, operation, and maintenance of vehicles. Question the motor sergeant about the procedures of handling the maintenance sections.

Learn the policies of dealing with the batteries.

Call all maintenance personnel together and tell them that there will be no changes in the procedure until further notice. The first few weeks should be spent in observing and learning. Do not assume anything: many procedures and policies at first may appear to be incorrect but there is usually a reason for things being done as they are; the existing solution may be the best in that particular situation.

During the first weeks make a record of everything that could be improved. More will be observed in the first weeks than in later ones. Make a notation of what is considered bad practice; after a while reconsider—and if it still appears incorrect, make corrections. If a change in procedures is considered desirable, talk it over with the personnel concerned and find out if the proposed procedure has been tried before and if it will be beneficial.

Get oriented and have a basis for corrections and improvements. Do not make rapid or radical changes. Changing the practices of personnel is a slow process. Be patient but determined, and reorganize gradually.

Inspections

An inspection is an examination to disclose the degree of compliance with established standards. A standard is the established measure of performance or quality with which an operation or result is compared. Standards vary according to the requirements of existing conditions or circumstances. For example, the standard of cleanliness of a vehicle in garrison under ideal conditions is different from that required in a combat area where the camouflage effect of dust and mud are desirable. Vehicle failures may occur when operation, adjustment, and repair conform to existing standards. Repeated failure indicates a need for change in the existing standards or in the manufacture of the vehicle.

Conclusions drawn from intelligent inspections will indicate the validity of a standard and provide information for a change in procedure or manufacture to correct a faulty standard (WD AGO Form 468, Deficiency Report).

The purpose of inspection of motor vehicles is to insure that operation, use, maintenance, and supply of vehicles are adequate to meet the needs of combat.

The scope of inspections will vary from the maintenance inspection made by the vehicle driver to that performed by technically trained personnel using equipment available only in the higher echelons of maintenance. Inspection of motor vehicles includes appearance and mechanical condition of vehicles in operation; determination of the cause of failure of any unserviceable vehicle; manner of performance of maintenance service operations; condition and adequacy of tools, equipment, and supplies; use of vehicles in accordance with regulations; evidence of abuse of vehicles or equipment; condition of vehicles in storage.

Inspections of any type or purpose demand keen observation, specialized knowledge, and experience in order to recognize any deviation from normal or standard. A system is necessary to insure that no item is overlooked, about which information is wanted. A procedure sheet may list the information desired, but only the person making the inspection can obtain and record that information.

There are two general classifications of inspections, command and technical. Inspections incidental to maintenance services are considered as part of those services rather than specifically as inspections. Inspections are the origin of maintenance work. They may disclose vehicle condition and indicate the service or repairs necessary. On completion of a maintenance service the vehicle is again inspected as a final check for correction of noted defects.

Command inspections: It is the duty of all commanders to inspect their vehicles, to check on maintenance and operating personnel, and to ensure that subordinate commanders are complying with procedure and regulations. In addition to scheduled inspections they will make frequent and unannounced inspections, and make inquiry as to adequacy of quantities and types of vehicles; maintenance; operating personnel; supplies and equipment; economical assignment, pooling and use of vehicles; and will take appropriate action to correct unsatisfactory conditions.

Command inspections are classified as informal and formal. An informal command inspection is made by the commander without warning or preparation of the vehicles. It will be as detailed as time and the technical training of the commander permit. The benefit from informal command inspections is in the improved performance of service operations when maintenance personnel have visible evidence of the commander's interest in their work.

If the commander is unfamiliar with technical details, select a few items, show him how to inspect them, and describe the result of improper maintenance. At each inspection select and instruct on different items. Accurate technical information regarding vehicles can be imparted readily by this method.

Officers must use discretion in making changes or corrections during an inspection unless they are technically qualified and are familiar with local conditions or existing instructions. An order or recommendation from an inspector carries weight and must avoid inaccurate or inconsistent instructions.

A formal command inspection is made by the commander at a stated time and place. It usually requires preparation of vehicles and equipment. The commander may detail subordinates to obtain information relative to items of the inspection in order that complete information may be obtained.

Every commander should be invited to make frequent informal command inspections. While assisting in an informal inspection the motor officer can call attention to (and make recommendations for) changes which require help from the commander. By personal contact the commander obtains information possible by no other means.

The battalion commander and motor officer should organize an inspection team of staff members to assist in command inspections. Prior to inspection, the personnel should be well informed how to inspect the items they have been assigned. They should know the cause and the effect of observed conditions, and be prepared to answer the questions that are likely to be asked. If staff members inspect with a knowledge of standards and with an attitude of constructive criticism, the information obtained will be accurate and complete.

Problems which the motor officer may request the commander to observe are deficiency of training time, assignment of drivers to vehicles, difficulties of performing maintenance, deficiencies of tools and equipment.

Technical inspections are complete examinations of materiel to determine the serviceability, completeness, and readiness for intended use of the equipment to be issued to troops; or, examinations and tests to discover difficulties encountered by combat troops with materiel, so that efficiency may be improved. These inspections will be performed by technically qualified personnel of the third, fourth, and fifth echelons, under direct supervision of technically qualified officers. Whenever a vehicle goes to a third or higher echelon maintenance shop for repair, it will be given a technical inspection by qualified service personnel to insure that all mechanical defects have been corrected prior to its return to the using organization.

A system of continuing technical inspections of vehicles in the hands of troops will be established by the commander concerned. These inspections will cover at least 10% of all automotive vehicles and equipment each 6 months. Vehicles to be inspected will be chosen at random and without prior notification. The commander and motor officer of the battery, battalion, regiment, or other unit to which the vehicle is assigned or attached *will be notified in writ-*

as to the result of the inspection. This notice will include mention of any evidence of vehicle abuse. All repairs found necessary because of vehicle abuse will be noted on the form and such abuses will be reported to the commanding officer. If necessary repairs are not caused by vehicle abuse, this fact will be stated (AR 850-15).

Inspections that are part of scheduled maintenance procedure are technical in nature but are not classified as "Technical Inspections." Inspection incident to maintenance service is made by technically qualified personnel of the unit performing the service. However, a commander may determine the quality of maintenance and improve the state of training within his organization by utilizing the services of an inspection group to perform maintenance inspections at any time or place.

The appearance of the vehicle will be observed but the important part of a maintenance inspection is that which determines the lubrication and operating conditions of vehicle units and the quality and completeness of the prescribed maintenance service operations. The monthly or bi-weekly motor vehicle inspection is made by an officer (or, under his direct supervision, qualified enlisted personnel) to determine the quality and completeness of preventive maintenance performed by the company, battery, and similar units, and the maintenance service operations necessary to meet existing standards. The semi-annual or monthly motor vehicle inspection is made by unit motor officer (or, under his direct supervision, qualified enlisted personnel) to determine the quality and completeness of preventive maintenance performed by the subordinate units and the maintenance service operations necessary to meet existing standards.

Driver Training and Permits

The standards to qualify a driver must be set high; a driver will attach the same value to his permit that is given to it by his superiors. Only a man who is trained and thoroughly understands first echelon operation and maintenance can be qualified as a military driver. (See AR 850-15.) In the event that the battalion training program requires drivers before they have completed their training, select those drivers and give them intensive training. Do not waive requirements. (See AR 850-15, Responsibility for Accidents.) The men who will drive in a column during training under supervision need not be given a permit until they have met the prescribed requirements. (Temporary student driver identification.) A record should be kept of each driver and the number of his permit. Battery motor officers, and selected maintenance personnel, should continue training drivers on items classed as advanced operation and maintenance. This should continue until each driver is proficient in all phases of combat driving. First echelon maintenance examinations should be given periodically and the best men rewarded.

Every motor officer should be taught how to stimulate driver pride. In the first place, a man must want to be a driver, then he must be taught the things he is required to do. A man cannot be expected to like a job about which he knows little. During the basic training period, drivers should be told that the men doing the best work will be given the opportunity to pick the vehicles that they wish to drive.

Have the driver assigned to the vehicle (AR 850-15). Allow no one else to drive that vehicle except in an emergency. This regulation should be included in a battalion directive, making it emphatic that only the assigned driver or assistant driver will drive this vehicle. Let the driver know the vehicle is his to care for and operate.

Let him select a name for his vehicle. Encourage names with historical background—but if he wants to name it after a girl friend, paint the name on for him. Paint the driver's name on the vehicle or on a placard to be attached to the vehicle. Conform to local regulations on naming and painting the vehicle.

Nothing is more detrimental to driver's morale than to require his vehicle to be in the best of condition, and have no facilities available to make it possible. The officer in charge must provide tools and supplies and have them available for the driver's use. The principal item is *time.* The most common complaint is that the chief of section and the crew devote their time to care of the weapons and leave the vehicle entirely to the driver. Chiefs of section should distribute work equally.

An award of time off from duty for the driver of the best vehicle in each battery each week is one of the greatest builders of morale. Post the name of the chief of section and driver having the best vehicle on the battery bulletin board. Personal attention to drivers having difficulties is necessary. Evidence of personal interest of the motor officer in each driver is helpful to morale.

The motor officer will want to assign the new or better vehicles to the drivers of less experience. Older and more experienced drivers will feel that they are entitled to the better vehicles. They must be told that this is a challenge to their skill and that they are given these vehicles because of the confidence in them and knowledge that they can keep them rolling. Explain to the driver of the new vehicle that he is expected to keep it in good condition.

Have the driver present at all times when work is done on his vehicle and allow him to assist the mechanic. It is necessary that the driver be with his vehicle for the regular maintenance service operations in order to ask questions and learn more about his vehicle. The chief of section should be present if possible. If there are deficiencies caused by improper driver maintenance, they can be brought to his attention. Any damage that has resulted or might result should be explained and method of prevention shown.

Driver pride is in a specific vehicle and not in vehicles in general. Good maintenance cannot be had without good drivers. High morale and good spirit are essential. Drivers must feel that the vehicles are their own, that their job is important and that the officers in the battalion are interested in them and their vehicles.

Dispatch of battalion vehicles

The battalion motor officer is interested in the utilization of battery vehicles as it affects maintenance, and should work out a dispatch system. Until a unit has its full complement of vehicles, operation demands are variable and the dispatch system must change accordingly.

When in garrison the dispatch system is controlled by battalion, to reduce the unauthorized and improper use of vehicles, to use fewer personnel, and to have information of vehicles available for use.

Requests for vehicles for training purposes should go through a central dispatch office, for coordination and assignment. They must be presented to the central dispatch office sufficiently in advance to permit the motor officer to plan for scheduled maintenance and consolidate class and individual requirements.

After a unit receives the vehicles prescribed by the T/O & E, requests for transportation may be discontinued. Headquarters Battery will usually furnish vehicles for administrative travel, Service Battery for supplies, and the lettered batteries will take care of their own details.

The battalion dispatcher should see that each driver leaving the motor park has an authorized trip ticket, War Dept. Form No. 48. The names of those authorized to dispatch battery vehicles should be on file in the central dispatch office. Trip tickets must be kept correctly and completely. An occasional inspection should be made of trip tickets to insure that they are correct and that the mileage driven appears to be reasonable. The dispatcher also records the trip ticket on his "Daily Dispatch Record of Motor Vehicles," W.D. AGO 9-75 (Old OO Form 7361) (AR 850-15).

Selection of personnel

For maintenance sections (as for elsewhere), hasty assignment is not selection. It is necessary to spend time studying classification records, interviewing the men, observing them at work, and examining them for technical knowledge before a selection can be made. An alternate should be trained for each job. A trial period should elapse before ratings are issued. The desire of the candidate for the job and ability to do it are almost equally important.

Selection of men to attend a service school should be a duty of the motor officer. It is better to send good men whose value to the organization will be increased rather than poor men who will receive little benefit from the training and be of little value to the organization. It is suggested that the number of students to be sent to school be determined and the maintenance personnel be encouraged to apply. Assignment for advanced training should be considered as a reward of merit.

Standing Operating Procedures

SOPs are necessary for the smooth and expedient functioning of an organization. They should be itemized and published as an order. These procedures can eliminate many difficulties of maintenance and operation. They must be in accordance with regulations, directives and existing circumstances. The following subjects are amenable to SOP: duties of personnel; issue of and responsibility for vehicles and

tools [motor vehicles with tools may be issued to chiefs of section by the battery commander on memorandum receipt and the chief of section will be responsible to the battery commander for their operation, servicing, maintenance, and condition; chiefs of section may obtain a memorandum receipt from each driver for his vehicles and equipment]; dispatch of vehicles; supply procedure (parts, fuel and lubricants, cleaning and preserving materials, miscellaneous); work orders to higher echelon; inspection procedure (formal, informal, spot); safety precautions; field operations (reports, refueling, supply, evacuation of disabled vehicles).

Parts Supply

A duty of the battalion motor officer is the procurement, storage, issue, and keeping records of spare parts. Essential to procurement and issue are

A proper storage and locator *system* (knowing whether a part is on hand and where it can be found).

Efficiency in submitting *requisitions.*

Initiative in following up parts requisitions. An efficient method of handling parts and keeping records will reduce the delay of vehicle repair. The reasons for part failures must be analyzed and every effort made to reduce the demand for parts.

Full stock of authorized spare *parts.* The Standard Nomenclature Lists authorize the second echelon certain vehicle parts for stock. Detailed information concerning the spare parts policy should be available from the division or similar unit automotive supply officer. The unit should have the parts on hand or a requisition for such parts.

Spare parts must be stored in a manner to prevent damage. Suggestions: If parts bins are not issued, some must be made; make them so that they will fit into a parts truck or trailer and can easily be loaded. Number the bins and letter each drawer. When the spare parts stock is issued make an inventory list. Make two cards (3"x5") for each part; on each card enter the name and number of the part, the amount authorized to have in stock, and number actually on hand; the difference should be on requisition. Enter on the cards the bin number and the drawer letter in which the part is stored. Attach one card to the part and file the other; the cards should be filed with the part names arranged alphabetically. When the part is issued, make the appropriate change on the card and requisition a replacement. Frequent inspections of the supply room must be made to insure proper storage of parts and that supply records are in order.

The locator system can be used in garrison or in the field, as long as the parts are stored in bins. Not being able to find a part is the same as not having it. If nuts, bolts, cotter pins, gasket material, and other parts common are kept available for maintenance personnel, it relieves the supply sergeant of much work—but the misuse of such supplies must not result.

In addition to taking care of parts, the supply sergeant or corporal usually has charge of all special tools. Tools must be kept in an orderly manner, in good repair, and available for battalion and battery maintenance personnel for work within their echelons.

WD AGO 9-79 (old WD OO Form No. 7365) may be used for parts requisition (AR 850-15). The system used in requisitioning parts should be obtained from the higher echelon automotive supply officer.

Forms that may be used for job orders are listed in AR 850-15. The motor officer, accompanied by the supply noncom, should go to the job order section of 3d echelon and learn what system is to be used. Only one or two men should be allowed to deal with 3d echelon for parts and job order requests, to avoid friction and misunderstanding.

Interchanging parts on vehicles must be done with discretion. Two or more vehicles may be kept in operation at the expense of one on deadline. If a serviceable part is removed from vehicle "A" which is on deadline, and that part is installed in vehicle "B" in order to make "B" serviceable, the worn part taken from "B" should be installed on "A." When the replacement part has been received it can be installed on "A." Motor officers can cooperate in exchanging parts. For example, one motor officer may have two vehicles of different makes deadlined for the lack of parts. Another motor officer may also have two corresponding vehicles deadlined but for different reasons, making a total of four unserviceable vehicles. By exchange of parts it should be possible to get at least two vehicles back into service and reduce the number deadlined.

Suggestions for Training

Standardization of instruction and grading are very desirable in the battalion. The courses should be outlined and the outlines conformed to in training. Records should be kept of student attendance and subjects taught.

It is difficult to find time for instruction of mechanics because they are usually busy performing preventive maintenance. In order to get a maximum amount of instruction from a minimum number of class hours the following method can be used. The motor officer can prepare study assignments and questions from any instructional material that is accessible to the personnel, such as Vehicle Maintenance Manuals, Field and Technical Manuals. Automotive instruction texts may be purchased from personal or organization funds. If the assignments are read and the study questions completed before attending class, a large amount of material can be covered in a minimum number of class hours.

In addition to the actual operation and maintenance of vehicles there are a number of subjects that maintenance personnel must know before they are equipped for combat. These subjects are taught to some extent in basic training, but additional training and constant practice are necessary to make the personnel proficient. They include decontamination of vehicles (proficiency in care and use of second echelon decontaminating equipment); vehicle recovery (knowledge of scouting and patrolling, use of maps and compass to locate and recover disabled vehicles); operation of radio sets; operation of crew-served weapons; recognition and disposal of booby traps.

Overseas movement

The motor officer should have a file of the loading specifications of his vehicles consisting of overall length, width, breakdown height (if vehicle has fixed cab, it will be to top of cab), and dimensions of special vehicles; weights of vehicles empty and loaded, and of load. The gross weight should be in long tons (2,240 lbs).

Loading priorities should be determined and vehicles classified accordingly.

AR 55-455, Preparation for Overseas Movement (POM) WD, US Army Specifications 100, 14A, and identification of Organizational Impedimenta and Preparation of Records Concerning its Shipment (101) WD, should be obtained, carefully studied, and complied with.

Complete lists of vehicles and equipment should be made and distributed so that a record is available to battalion officers traveling on different ships.

The motor officer should inspect vehicles for proper unit identification, markings, shipping classification data, and directed equipment loading lists.

Only those vehicles that are in satisfactory condition will be processed for shipment overseas. A record of the most recent monthly and semiannual maintenance services must accompany the individual vehicles to the port of embarkation. This information for the port authorities is necessary before the vehicles are waterproofed or processed for loading.

A successful card system of recording the shipment of vehicles should be adopted in order that the driver may claim the vehicle to which he is assigned, and should contain the vehicle administrative data, the ship code number, and the driver's name (recorded on cards). The driver is given the card as identification to the debarkation port authorities for delivery of the indicated vehicle.

Theater of Operations

The battalion motor officer must maintain data on the average mileage per gallon per type of vehicle for types of terrain that may be anticipated. A safety factor consisting of an amount required to compensate for wastage, accidents, or unexpected weather, should always be figured. A safety factor of 20% is reasonable for a tactical motor march.

For battalion maintenance in combat, the motor officer may wish to divide the regimental or battalion maintenance section into light and heavy maintenance crews. The light maintenance crew consists of parts, supply trucks, supply personnel, light maintenance truck, and designated mechanics. The heavy maintenance crew includes a tank recovery vehicles, wrecker and crew, designated mechanics and welder, and motor officer at the rear of the column. On a tactical

march the light maintenance crew of the second echelon section will perform minor roadside repairs and replacement of parts. A well qualified mechanic riding in the parts truck discovers the trouble and determines the amount of work and time to make the necessary adjustment or repair. If the repair is minor, the required spare part or parts is left with the driver of the disabled vehicle and the parts truck then continues with the column. The light maintenance truck and crew will arrive when the parts supply trucks have moved on and the mechanics make the necessary repairs. If a considerable amount of time is required to make the repairs, the vehicle may be towed by the light maintenance truck to the place of noon halt or bivouac area. The heavy maintenance crew will recover the vehicle if it is unable to move on its own wheels or tracks. If the vehicle is totally disabled, it will be evacuated by third echelon.

The motor officer rides at the rear of the column to ensure that none of the organization vehicles are passed by the wrecker or tank recovery vehicle, individual vehicles infiltrating the column from the rear are controlled, first aid is administered to injured if medical personnel are not present.

Mechanics from the battery maintenance sections should be attached to the ammunition train, one mechanic for each section. The mechanic is responsible that the vehicles assigned to him are inspected at every opportunity and repaired when necessary. This work is in addition to his battery maintenance duties.

Factors governing selection of location for shops: accessibility of area and nearness to good road, size of area and suitability for work, protection of area.

The Civilian Automotive Advisor

For mission of the automotive advisor, see WD Circular 98, 8 March 1944. His work is to advise and instruct, under supervision of the responsible officer, on proper care, servicing, and repair of vehicles and parts thereof. Advisors exercise no command, cannot issue directives, but can initiate directives through the motor officer.

Advisors can be well used as liaison between battery and battalion and between battalion motor officer and battalion commander.

PUBLICATIONS PERTAINING TO MOTOR VEHICLES

Publications pertaining to motor vehicles originate in the War Department Adjutant General's Office or the Ordnance Department.

Publications

The Adjutant General's Office:
- AR—Army Regulations
- FM—Field Manual
- TM—Technical Manual
- TB—Technical Bulletin
- MWO—Modification Work Order
- TC—Training Circular
- WDC—War Department Circular
- SB—Supply Bulletin

The Ordnance Department:
- FSMWO—Field Service Modification Work Order
- Ord 2 OPSI—Ordnance Publication for Supply Index
- SNL—Standard Nomenclature Lists
- OSPE—Organizational Spare Parts and Equipment
- SPC—Service Parts Catalog

Channels of Distribution

Within the United States, publications are distributed from Adjutant General's Depots in each Service Command to publication officer each post, camp or station. Organizations requisition publications from Post Publication Office.

Outside the United States, publications are distributed as follows:

European Theater of Operations (ETO) by Ordnance Publications Section, General Depot G-25, APO 518, c/o Postmaster, New York, New York.

Units using APO 456, by the Ordnance Publications Officer, Box 5, APO 456, c/o Postmaster, San Francisco, California.

South Pacific Units, by the Ordnance Publications Office, Hq. South Pacific General Depot, APO 502, c/o Postmaster, San Francisco, California.

Other units with San Francisco APO, by the Ordnance Publications Officer. Box 5, APO 456, or the Ordance Officer, Base Section 3, APO 923, depending on their location.

Units with Seattle APO, by Port Military Publications Supply Officer, Moran Building, Seattle Port of Embarkation, Seattle 4, Washington.

Units with Minneapolis APO by Chicago AG Depot.

Units with New Orleans or Miami APO by Atlanta AG Depot.

Units with New York APO: (a) Ordnance Publications Section, General Depot G-25, APO 518, if located in the ETO; (b) The Ordnance Officer, Ordnance Section, Hq. MBS Depot 150-0, APO 600, if located in territory served by that APO; and (c) on New York AG Depot if located elsewhere.

Army Regulations (*AR*) are the basic administrative regulations for the entire War Department. They contain other administrative matter pertaining to specific arms and services. Army Regulations of particular interest are:

AR 1-5—Index to Army Regulations
AR 1-10—List of Current and Suspended Pamphlets
AR 45-80—Ordnance Department: Ordnance Property
AR 310-200—Military Publications: Allowances and Distribution
AR 600-81—Driver and Mechanics Award
AR 850-5—Marking of Clothing, Equipment, Vehicles, and Property
AR 850-10—Registration of Motor Vehicles
AR 850-15—Military Motor Vehicles
AR 850-18—Storage of Motor Vehicle Equipment
AR 850-20—Precautions in Handling Gasoline

Changes and supersession of Army Regulations listed in AR 1-5 and 1-10 will be listed in WD Pamphlet 12-6.

Field Manuals (*FM*) are concerned with training and field operations. Field Manuals of particular interest are:

FM 21-6—List of Publications for Training—published monthly and lists:
- Combined Communication Board Procedures
- Field Manuals
- Firing Tables and Charts
- Lubrication Orders
- Mobilization Training Programs
- Technical Bulletins
- Technical Manuals
- Technical Regulations
- Training Circulars

FM 21-7—List of Training Films and Film Strips
FM 21-8—Graphic Training Aids
FM 5-20—Basic Camouflage Principles
FM 5-20-B—Camouflage Painting of Vehicles and Equipment
FM 17-50—Logistics (contains a good chapter on motor marches)
FM 25-10—Motor Transport
FM 31-25—Desert Operations
FM 70-15—Operations in Snow and Extreme Cold
FM 100-5—Operations
FM 100-10—Administration
FM 101-15—Traffic Circulation and Control

WD Pamphlet 12-3. List of forms stocked by Adjutant General Depots.

WD Pamphlet 12-6. This pamphlet is published monthly and lists the following:
- Mobilization Regulations
- Modification Work Orders
- Readjustment Regulations
- Supply Bulletins
- SB 9-9 Current Ordnance. FSB and MWOs.
- War Department Pamphlets

Technical Manuals (*TM*) contain the specific technical information needed by the various arms and services in performing their functions. They are listed in FM 21-6.

TM 6-605—Field Artillery Individual and Unit Training Standards
TM 9-834—Vehicular General Purpose Unit Equipment
TM 9-850—Cleaning, Preserving, Lubricating, and Welding Materials (see also SNL K1 and K2)
TM 9-2800—Standard Military Motor Vehicles (weights, dimensions, etc.)
TM 9-803—¼-ton C&R Ford, Willys
TM 9-808—¾-ton, 4 x 4, Dodge
TM 9-810—1½-ton, 4 x 4, Dodge
TM 9-805—1½-ton, 4 x 4, Chevrolet
TM 9-801—2½-ton, 6 x 6, GMC

TM 9-811—4-ton, 6 x 6, Diamond-T
TM 9-785—High-Speed Tractor, M4
TM 9-786—High-Speed Tractor, M5
TM 9-788—High-Speed Tractor, M6
TM 9-731E—Carriage, Motor, 105-mm How, M7
TM 9-710—Basic Half Track
TM 10-450—Sheet Metal Work, Body, Fender and Radiator Repair
TM 10-510—The Motor Vehicle
TM 10-550—Fuels and Carburetion
TM 10-560—Chassis, Body and Trailer Units
TM 10-565—Automotive Brakes
TM 10-580—Automotive Electricity
TM 10-585—Automotive Power Transmission Units
TM 10-590—Hand, Measuring, and Power Tools
TM 11-401—Training Film and Film Strip Projection
TM 21-250—Army Instruction
TM 21-300—Driver Selection and Training, Wheeled Vehicles
TM 21-301—Driver Selection and Training, Track Vehicles
TM 21-305—Drivers' Manual (supersedes TM 10-460)
TM 31-200—Maintenance and Care of Pneumatic Tires and Rubber Treads
TM 37-2810—Motor Vehicle Inspections and Preventive Maintenance

War Department Lubrication Orders are the approved instructions for first and second echelon lubrication of vehicles and equipment. They are listed in FM 21-6.

Training Circulars (*TC*) promulgate new doctrine for test, disseminate War Department training policies, and are used to make general amendments to field manuals. Changes to Army Regulations previous to publication and distribution of the actual "Change No. _____ to AR _____" may be published in a Training Circular. Training Circulars carry in bold faced type the date on which the circular becomes void unless previously superseded or rescinded by other action. They are listed in FM-21-6.

War Department Circulars (*WD Cir*) are usually directive in nature, general in application, but temporary in duration. War Department Circulars are commonly used for administrative and supply information, and are listed in WD Pamphlet 12-6.

Supply Bulletins (*SB*) are listed in WD Pamphlet 12-6.

Modification Work Orders (*MWO*) are instructions issued to the field, authorizing and describing in detail modifications or changes to be made to materiel. The time limit for completing the job is indicated by a color band on the Modification Work Order.

"Red band" modifications are to be performed immediately.

"Green band" modifications can wait until the time of the next arsenal overhaul.

"Blue band" modifications are between the two former in urgency and may be done when all red band MWOs have been completed.

The Modification Work Order supersedes the Field Service Modification Work Order (FSMWO) formerly issued by the Ordnance Department (WD Cir No. 4, 1944). Modification Work Orders are listed in WD Pamphlet 12-6.

Ordnance Technical Bulletins (*TB*) furnish technical information to the field in advance of publication in 9-series technical manuals and 23-series Field Manuals "Basic Weapons" and are listed in FM 21-6. Technical Bulletins of special interest are:

TB ORD 67 (1944)—Storage Batteries
TB ORD 126 (1944)—Lubrication
TB ORD 173 (1944)—Unit Replacement and Repair Time Guide for Wheeled Vehicles.

Ordnance Publications for Supply Index (*ORD 2 OPSI*) lists the complete Standard Nomenclature List (SNL) for Ordnance materiel.

Standard Nomenclature Lists (*SNL*) are lists of parts and equipment for use in the requisitioning, supply and procurement of ordnance materiel, and are indexed in ORD 2 OPSI. They constitute a system of uniform nomenclaure for ordnance materiel and are the medium through which details not shown in the Table of Organization and Table of Equipment are published. Ordnance materiel is classified into 19 groups, each designated by a letter. Groups of special interest are:

Group G—Motor Vehicles (tanks, tractors, trucks, etc.) (G-27, Set 2, Tool Sets, Motor Transport)
Group H—Standard Hardware, etc.
Group J—Standard Tools, etc.
Group K—Cleaners, Lubricants, Welding Supplies, etc., K1 and K2 (See TM 9-850.)
Group N—Sets of Special Use Equipment

Tables of Organization (*T/O*) list personnel allotted to a unit. *Tables of Equipment* (*T/E*) list equipment allotted to a unit.

The above T/O and T/E are indexed in the "List of Tables of Organization and Equipment, Tables of Basic Allowance and Tables of Allowances."

List of War Department Publications issued during _____ 194_____ is a monthly index of General Orders, Bulletins, numbered circulars, and War Department Memorandums issued during the month.

Weekly Directive, Headquarters, Army Ground Forces, is a publication designed to bring to the attention of all elements of the Army Ground Forces, pertinent and important information published in the foregoing publications, as well as new doctrines of training and changes in the administrative policies of the Army Ground Forces.

"The Army Motors" is a monthly magazine intended for personnel engaged in Motor Transport activities, including drivers. *Army Motors* keeps the field abreast of current technical automotive information, preventive maintenance procedures, new publications and regulations, data on procurement of new parts, assemblies, and accessories, manufacturer's recommendations, and any other information affecting operation and maintenance of motor vehicles. Published by Preventive Maintenance Branch, Maintenance Division, Office Chief of Ordnance, Detroit 32, Michigan.

Changes. The many changes occurring in official publications make it necessary that the user keep each book (and this article) posted up-to-date in order to obtain the maximum benefits.

ARE YOUR OPTICS COATED?

Something new has been added lately to Army optical equipment. Everybody who uses binoculars, telescopes, height finders, and the like should know about it. An infinitely thin coating of magnesium fluoride is being applied to the lenses and prisms of such equipment. Light transmission is greatly increased by the coating. The "seeing" ability of telescopes is increased as much as 50%, and targets can be identified 15 to 30 minutes later at night and earlier in the morning. Glare, halos, and ghost images are eliminated. Standard binoculars which are coated have a 20% greater range of vision at night.

Instruments which have coated lenses can be identified by visual inspection. Hold the instrument at an angle to a natural or artificial source of light and observe the reflected light. If the optics are coated, the reflected light will have a distinctive purplish tinge. This purplish tinge is often observed by personnel when they are cleaning a lens. It usually leads them to believe that the lens is dirty or discolored, whereupon they proceed to remove the film. Naturally, this should never be done.

Coated instruments should be handled with even greater care than uncoated instruments. They should be given the utmost protection against dust and dirt so they won't have to be cleaned more frequently than is absolutely necessary. The use of ethyl alcohol, grade 1, and lens cleaning liquid soap will not affect the coating unduly (see TM 9-850 for cleaning instructions). But excessive rubbing will remove the fluoride film and must be avoided. Removal of the coating from the objective or eye piece, either partially or completely, does not render the instrument useless. It does, however, destroy the benefits of the coating. This makes it necessary to reapply the film—which is a complex job for higher echelon shops—to restore the advantage of the coating.

To be able to see farther and more clearly is an important advantage in military operations. To enjoy these benefits, it is important that coated instruments, which provide the benefits, be treated with the best possible care.

Diary of War Events

(As Reported by the American Press—Edited by B. H. W.)

APRIL, 1945

1st U.S. 10th Army under Lt. Gen. Simon Bolivar Buckner lands on the west coast of Okinawa in the Ryukyus.
B-29s bomb Tokyo.
Jap losses in the Philippines total 308,180; U. S. casualties total 31,132.

2nd Allied armies in Germany continue successful advances.
U.S. 10th Army advances across Okinawa to the east coast near Tobara.

3d Allied armies on western front capture Kassel and Gotha.
1,400 U.S. planes bomb U-boat plants at the Kiel naval base.
Large force of B-29s raids 2 industrial areas near Tokyo.

4th U.S. bombers again raid Kiel.
Red Army captures Bratislava and pushes within 2 miles of Vienna.
U.S. bombers raid Hong Kong, destroy 28 Jap ships in the China Sea.

5th Soviet Russia denounces her neutrality pact with Japan.
Japanese government cabinet resigns.
Gen. MacArthur and Adm. Nimitz to head all Army and Navy forces against Japan.
U.S. bombers again raid Hong Kong. 5,000 allied planes bomb the Reich.
Russian troops advance to the city limits of Vienna.

6th Allied armies on Western Front push forward 5 to 30 miles.
650 heavies bomb rail networks south of Berlin.
U.S. 5th Army in Italy advances 2 miles southeast of Massa.
Jap planes attack our invasion fleet of Okinawa—U.S. fighters shoot down 150 planes.
U.S. heavy bombers again hit Hong Kong.

7th U.S. 5th Fleet encounters Jap Fleet 50 miles southwest of Kyushu and sinks 6 warships, 2 cruisers, and 3 destroyers.
Jap planes sink 3 U.S. destroyers off Okinawa but lose 417 planes.
300 B-29s destroy 122 Jap planes in an attack on Tokyo and Nagoya.
U.S. 3d Army finds $100,000,000 gold cache hidden in salt mines 140 miles from Berlin.
U.S. fliers shoot down 63 of a fleet of German planes that attempt to intercept a force of 1,300 U.S. bombers over Germany.
U.S. 5th Army in Italy captures Mount Fragolito.

8th Russians open an all-out assault on Koenigsberg.
1,200 U.S. bombers smash airfield and ordnance depots in Central Germany.

9th 1,250 U.S. heavies smash airfields around Munich.
Russian troops capture the center of Vienna.
U.S. Marines on Okinawa gain control of half of Mobobu Peninsula.

10th Allied armies on the Western Front advance 25 miles.
Allied fliers destroy 397 planes over Germany.
British 8th Army in Italy crosses the Senio River and U.S. 5th Army captures Massa.
U.S. troops land on Jolo, gain control of Sulu Archipelago.

11th U.S. 9th Army's 2nd Armd Div advances to within 63 miles of Berlin.
Spain breaks diplomatic relations with Japan.

12th President Roosevelt dies suddenly and unexpectedly from a cerebral hemorrhage at Warm Springs, Ga.
Harry S. Truman sworn in as President of the United States at 1909 hours.
U.S. 9th Air Force destroys 117 German planes.
Jap fliers resume suicide attacks on U.S. ships off Okinawa. Sink 1 destroyer and damage several others. Our troops shoot down 118 Jap planes.

13th U.S. 3d Army advances 32 miles across Germany.
Russian troops capture Vienna.
Allied troops advance at both ends of their front.
B-29s bomb Tokyo.

14th 750 RAF heavy bombers raid Berlin.
U.S. Marines on Okinawa advance to northern tip of island.

15th German stiff resistance slows down center of Allied armies.
British 8th Army in Italy captures Imola, 18 miles from Bologna.

16th Allied fliers sweep German airfields, destroy 905 Luftwaffes.
Pacific Fleet planes destroy 368 Jap planes in raids over Kyushu, the Ryukyus, and the Okinawa area.

17th Gen. Eisenhower halts drive on Berlin to clean up pockets behind the battle lines.
Allied planes over Germany and Czechoslovakia destroy 282 German planes.
War Dept. reports that transfer of troops and supplies from Europe to the Pacific has begun.

18th U.S. 3d Army advances into Czechoslovakia. U.S. 9th Army captures Magdeburg.
Russian troops push to within 14 miles of Berlin.
British forces capture Argenta in Italy.
U.S. 24th Div lands at Malabang and Parang on Mindanao.
Japs capture Sinning in China.

19th U.S. 1st Army captures Leipzig and Halle.
British 8th Army in Italy drives the Germans from the Argenta Gap.
U.S. troops capture Cotabato on Southern Mindanao.

20th U.S. 7th Army captures Nuremberg.
Allied fliers pound Berlin's outposts.
U.S. 5th Army in Italy pushes into the Po Valley.

21st Red Army advances into Berlin.
U.S. 3d Army captures Czechoslovak stronghold of Asch.
Allied forces in Italy capture Bologna.
B-29s bomb Jap airfields on Kyushu Island.

22nd Red Army gains control of 1/6 of Berlin.
U.S. 5th Army crosses the Secchia and Panara Rivers and closes in on Modena.
B-29s raid Jap airfields at Miyazaki and Tomitaka on Kyushu.
Soviet Commissar for Foreign Affairs Molotoff arrives in Washington, D. C.

23d U.S. 3d Army changes direction toward Regensburg.
Allied Armies advance to the Po River in Italy.
U.S. troops on Mindanao capture vital junction of Kabacan.

24th Russian troops capture half of Berlin.
U.S. 3d Army advances to within 35 miles of the Austrian border.
Allied troops in Italy capture the port of LaSpezia, and the junction city of Modena and Ferrara.

25th Russian armies encircle Berlin and link up with U. S. forces at Torgau, on the Elbe River.
U.S. infantry captures Kakuzu on Okinawa.

26th U.S. 3d Army advances to within 8 miles of the Austrian border.
Marshal Petain returns to France for prosecution.

27th U.S. 5th Army in Italy smashes into Genoa, the last German naval base on the Mediterranean.

28th German people in Munich and other areas in southwestern Germany revolt.
U.S. 7th Army crosses the Austrian border after advancing 130 miles from Nuremberg in 9 days. U.S. 3d Army siezes Augsburg, 27 miles from Munich.
Allied troops in Italy capture Bergamo, 30 miles from Swiss border.
Jap aircraft attack U.S. warships off Okinawa. Sink an auxiliary surface vessel. Japs lose 57 planes in the attack.

29th U.S. 7th Army smashes into Munich.
U.S. 5th Army in Italy captures Milan. Italian Partisans execute Mussolini, his mistress, and more than a dozen other Fascists near Como.
Jap plane attacks U.S. Navy hospital ship off Okinawa. Kills 29 and injures 33.
U.S. troops on Mindanao sieze Padada airfield along Davao Gulf.

30th Soviet armies continue to clean up Berlin.
U.S. 7th Army captures Munich and the notorious Nazi extermination camp at Dachau.

BOOK REVIEWS

REPORT ON THE RUSSIANS. By W. L. White. 309 pp. Harcourt, Brace & Co. $2.50.

Last year Mr. White had an enviable opportunity to see as much as any outsider has seen of Russia and her people. He was part of Eric Johnston's party, when for the president of the U. S. Chamber of Commerce the Soviet government relaxed its long-standing rule of secrecy. Thus he saw Russia from the Finnish Front to the Caspian, from Siberia to the Ukraine. This was no tour pre-planned by the officials—the party went where it wished, saw what it wanted, spoke with whom it desired.

A sound reporter, Mr. White has turned out a straight, unvarnished account. He covers the great achievements of the Soviet economy as well as Russian disregard for individual self-determination. It is a rounded account, by no means so biased as recently published extracts would indicate. Those unfortunately raised international repercussions. Presumably they are correct, but they presented only one side of the glass; when the narrative is read as a whole, a much better perspective is gained.

This, then, is no white-washing book. It steps on many a sensitive toe. But it rings true.

SOLUTION IN ASIA. By Owen Lattimore. 207 pp.; index; endpaper map. Little, Brown & Co. $2.00.

Mr. Lattimore's oriental experience will rightly cause his thoughts to be respectfully received in high places. Cogently and concisely stated, they should be well known among us all. He speaks from a 25-year background as business- and newspaperman in China, researcher in Manchuria, Mongolia, and China, political adviser to Chiang Kai-shek, and OWI Director of Pacific Operations.

A fair part of *Solution in Asia* is a realistic review of recent Chinese and Japanese political history. Objective, impartial, and fair, Mr. Lattimore does not let his respect for individuals (as Chiang), or his closeness to the scene, blur his vision or muddle his account. He cuts through the fog many "experts" have developed by labelling the Chinese as "enigmatic," the Jap emperor as "divine," etc. Instead, he shows the people themselves to be people, with normal virtues, vices, and reactions. He finds them more interested in practicing dmocracy than in fine-spun occidental theories which are coupled with a factual imperialism.

This ties in, of course, with our Asiatic policy—or our past lack of one. For the future we must work *with* the orientals. Mere reliance on great bases will not solve the problems of everyday living, however useful armed strength may be in keeping Japan herself in check. The days of great colonial empires are past. Self-government must become a fact, if revolution is to be avoided and stability founded.

Mr. Lattimore has performed a notable service in writing this layman's book, one so free from bias, hysteria, or hearsay, one so down-to-earth.

CHINA AFTER SEVEN YEARS OF WAR. By Hawthorne Cheng, Samuel M. Chao, Chu Fu-sung, Frank Tao, Charles C. H. Wan, Floyd Taylor, and Jean Lyon; edited by Hollington K. Tong. 246 pp.; illustrated. The Macmillan Co. $2.00.

In Chungking, five young Chinese journalists with pre-war English-language-newspaper experience and two American associates, have written about "China today." It is about the Chinese *people*, written in China by seven authors who have lived through what they write about. Together they give a graphic picture of how the Chinese look and think and fight after seven years of war. They tell of the common man and the soldier and the families of both; of the capital and the small town; of life in the refugee universities and of literature and of the progress of political reform. Flyers who kept intact the lifeline over "the hump" are not forgotten. Neither are the infantrymen.

Dr. Tong, veteran journalist and publisher, has served the Chinese National Government as Vice-Minister of Information since before the war. Unquestionably this present book presents the government's point of view. That does not mean it is inaccurate; to the contrary, it is undoubtedly the more accurate because of its at-least-semi-official sponsorship. At the same time, however, many things are probably left unsaid. For several facets of the current situation, though, it gives the most authentic available information.

ALLENBY IN EGYPT. By Field-Marshal Viscount Wavell. 156 pp.; index; illustrated. Oxford University Press. $2.50.

Five years ago Field-Marshal Wavell published *Allenby: A Study in Greatness*, which admirably described and documented Allenby's military career. Years of war greatly slowed this second volume, but it is well worth the wait.

Great as were Allenby's wartime achievements, he rendered equally valuable service as Special High Commissioner for Egypt immediately thereafter. Egypt was fast approaching the status of a separate nation. British activities had brought prosperity, and with it a freedom of speech and thought. The Near East was seething with hopes from Versailles, as well as with disorders.

Allenby's job was a difficult one. He had to restore order, and support from London was far from what might have been desired. He was a man of action, accustomed to obtaining results and caring little for explanations. Thus although attacked by Londoners, he was respected by the Egyptians. "But both Great Britain and Egypt owe him a debt of gratitude. In a most difficult period in the relations between the two countries, he upheld essential British interests without causing bitterness; he secured for Egypt independence from a reluctant British government and a liberal constitution from a reactionary monarch."

Allenby's labors bore rich fruit 20 years later. From them we can draw many lessons useful in our dealings with many States after this war is past.

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LEYTE CALLING . . . By Lt. Joseph F. St. John, USA. 220 pp. Vanguard Press. $2.00.

AMERICAN GUERRILLA IN THE PHILIPPINES. By Ira Wolfert. 223 pp.; map. Simon & Schuster. $2.75.

Contrary to the popular impression at the time, the Philippines were not blacked out during the years following the surrender. There was regular radio contact with Gen. MacArthur. Arms and equipment were supplied to an organized and effective guerrilla force, which not only kept GHQ informed of developments but also greatly hampered the Japs. Most important of all, this group was the rallying point for Filipino resistance, and was a constant symbol that the Americans would return—and at the earliest possible moment.

Lt. St. John became a radioman and coastal spotter. Before then he traveled from Luzon to Leyte and Mindanao. His guerrilla work was largely back on Leyte. His account is a brisk, intimate one—straightforward and breezy, with no literary pretensions. Through it constantly shines the magnificent help given the Americans by the Filipinos, without thought of reward or of the dangers risked by the natives.

Mr. Wolfert has set down in more formal fashion a more rounded account of the activities of one of St. John's associates, Ensign I. D. Richardson. It complements the St. John book.

Together, these two books are outstanding in their recital of a vital phase of this war: the important guerrilla activities by both Americans and outstandingly loyal Filipinos.

DOUBLE TEN. By Carl Glick. 281 pp.; illustrated. Whittlesey House. $2.50.

Sometimes it takes a long while for events of great importance to come to light. For instance, how many have known that Chinese troops were trained in this country, preparatory to the revolution that overthrew the Queen Empress? That Chinese Royalists here tried to "take over" the revolutionary movement and to assassinate Dr. Sun Yat-sen? For the sake of the living, many such things must be kept under wraps for years on end. Finally some of them are committed to print before memories are too faded to tell the story. Ansel O'Banion's is one of those favored few.

Capt. O'Banion, one-time cavalry sergeant at Fort Riley and elsewhere, became a member of the Po Wong Wui, Chinese secret society. He worked and fought for the Chinese Revolution, directing the secret training of troops in some 21 U. S. cities. He smuggled Dr. Sun into this country and protected him while here. Closely associated with General Homer Lea, he obtained Japan's secret war plans, on which was based Lea's important *The Valor of Ignorance*. His story is a fascinating one, well told to Mr. Glick by the captain himself.

Now we are experiencing what might be called a continuation of that Revolution. In China it certainly is that. As action and true melodrama never lose their fascination, *Double Ten* has a distinct place even when war and revolution are on a scale far surpassing that of October 10, 1911.

SOUTH AMERICA CALLED THEM. By Victor Wolfgang von Hagen. 311 pp.; index; illustrated. Alfred A. Knopf. $3.75.

Mr. von Hagen, whose South American explorations and researches are wide, writes primarily of the explorations of four of the world's greatest naturalists. At the same time he tells more about South America than is to be found elsewhere in a single volume. Aside from dictators, revolutions, and the wars for freedom, this is the story of South America, for among them this quartet of giants covered it thoroughly. They may not have been the very first scientists to examine parts of it, but their attainments were so great and their travels so wide, that their coverage was truly comprehensive over a period of a century and a half.

In so short a review it is impossible to do more than briefly recall their fields. La Condamine was the equator-measurer. Humboldt truly wrote on his passport his purpose: "Traveling for the acquisition of knowledge." Darwin just barely got aboard the *Beagle* for the voyage which, from Galapagos Islands discoveries, led straight to his *Origin of the Species*. Robert Spruce was one of the world's greatest botanical collectors.

From the rain plains of the Orinoco and the Amazon's jungle, to the wastes of Tierra del Fuego, these men examined South America. Their adventures read like incredible fiction—yet they are true. This rich and flavorsome material is woven into a magnificent tapestry by

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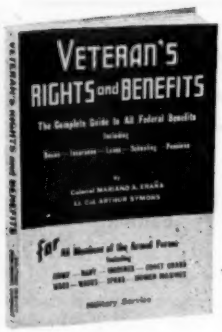

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THE SALINAS: Upside Down River. By Anne B. Fisher. 310 pp.; index; illustrated. Farrar & Rinehart. $2.50.

Through 150 miles of central California, the Salinas winds its way northward to Monterey Bay. Not long as our rivers go, narrow, and ever near the ocean, it waters one of the world's richest agricultural areas. This is the land too of Fort Ord and Camp Roberts, of Hunter Liggett Military Reservation and great flying fields.

In past years it was a land of missions and great cattle ranches. You have glimpses of it in *Two Years Before the Mast,* and intimate accounts in some of Stewart Edward White's later books. It was a romantic land then, full of Spanish customs and others imported from Mexico, whence the Spanish moved north in 1769. Despite its droughts and hardships it was a wealthy land and one of spirit.

In this 27th volume of the "Rivers of America" series, the pageant of the valley is delightfully told. The old dreamy life is here. Fremont and his men, and the coming of the gringos, brought war and intrigue, seldom very flattering to the newcomers. Gold brought its troubles. Then came expansion. Earthquake, sugar beet, lettuce, newly-come transportation—all affected the valley. This vignette of American life and history is well told.

SOLDIER TO CIVILIAN: Problems of Readjustment. By George K. Pratt, M.D. 233 pp. Whittlesey House. $2.50.

A number of books have recently been published, or are about to be, for the purpose of helping steer the returned veteran through the difficulties of settling down to the complex life of a civilian. This isn't one of them.

Dr. Pratt has written a common-sense book for the civilian community, for the relatives and friends of men in the services. There isn't a trace of molly-coddling in it, nor any supersensitiveness. It is a sound account of what army life does to the civilian who is flung into it, how it prevents strains of adjustment, gives a straight picture of what happens when that same civilian returns to his old haunts, and then gives some straight talk about how to handle problems in order to have the best solution for all concerned. As an appendix appears a guide for planning and coordinating community services for veterans, prepared under the auspices of the National Social Work Council.

Dr. Pratt is qualified to present such a book. In the last war he served both here and in France, and later was a rehabilitation consultant for the Public Health Service (which handled such things before the Veterans' Administration was established). Between wars he had wide experience in the field of mental hygiene. His interest is now sharper than ever, as one of his sons is a Signal Corps corporal in France.

CHUNGKING DIALOGUES. By Lin Mousheng. 149 pp. John Day Co. $2.00.

In form, this book represents ten evenings' discussions among a social scientist, a young radical, a telephone girl, an old conservative, and a Confucian philosopher. They discuss China's problems: her politics, the war, social and economic aims, and the like.

Don't let such an outline make you shy away from this little volume. It makes sense in any language, with people of any nationality substituted for the speakers. Not that it was Lin's aim to write so universally; after all, he is Chinese to the core, and not only has done much thinking on behalf of his country but also has talked lately with innumerable Chinese newly arrived from Chungking. From those discussions he has drawn much of his factual material concerning party strife, plans for education and industrialization, acceptance of foreign capital, and the like.

Yes, he had China very definitely in mind. But his smooth and witty book, spiced by tit-bits from the ancient sages, is a wise and mellow piece of writing that will stimulate thought almost unbeknownst to the reader.

ARTHUR ST. CLAIR. By Frazer E. Wilson. 245 pp.; bibliography; index; illustrated. Garrett & Massie. $3.00.

Some people believe in the accuracy of first impressions. Mr. Wilson does not, at least not in the case of St. Clair, first governor of the Northwest Territory and perhaps best known as the leader of

an ill-fated expedition against the Indians in 1791.

In this biography, much stress is laid on St. Clair's undoubted achievements on the frontier. Before his 15-year term as territorial governor, he took part in the French and Indian War and in the Revolution. He also served in Congress and public life. His motives and his thinking are clarified considerably by liberal quotations from his public and private papers.

Your estimate of St. Clair may or may not be changed by Mr. Wilson's account. Undoubtedly, however, it is a distinct contribution to the literature bearing upon the early days of this important section of our country.

THE YOUNG JEFFERSON. By Claude G. Bowers. 523 pp.; bibliography; index; illustrated. Houghton Mifflin Co. $3.75.

To abilities as editorial writer and diplomat, Mr. Bowers adds that of scholar. This combination has brought forth an outstanding biography of Thomas Jefferson, from boyhood to his return from France to become our first Secretary of State. With the earlier *Jefferson and Hamilton* and *Jefferson in Power,* it forms a complete 3-volume biography.

Mr. Bowers feels that the essence of Jefferson's thought and aims is to be found in his work in the Virginia legislature from 1776 to 79. Then he labored for creation of a democracy. Feudal concepts of property, religion, and the relation of Church and State fell before him. In his home state he was doing what in future years he would do for the whole of the new nation, when he would help frame its Constitution.

By giving in some detail Jefferson's five years as a diplomat in Paris, Mr. Bowers lays some old dragons. Jefferson's daily life, constant companions, and close friends belie the scurrilous claims that he was associated with the bloodiest figures of the Terror. Without doubt he favored radical reforms of government, but it is very doubtful that he believed the French people to be ready for the responsibilities of managing a Republic.

Under Mr. Bowers's skilled pen, Thomas Jefferson comes to life as few individuals have the fortune to do in books. The reader can readily believe that the Virginian was the titan the historians have assured us he was.

A SHORT HISTORY OF THE UNITED STATES. By Allan Nevins and Henry Steele Commager. 511 pp.; index; maps. Modern Library. 95c.

These two professors of Columbia University are not mere pedants. They both know their subject and love it and its meaning. Three years ago they published for the layman a concise history of the American people. It didn't pretend to embody original research, or to advance a particular thesis. It was simply the story of the evolution of a free society.

Now this excellent work is available in the convenient size (and price) of the Modern Library books. To the original, the authors have added a chapter bringing the chronicle up to last summer. The whole is excellent for any of us, and especially suitable for giving to the foreign friends many of us have recently made.

COACHING ROADS OF OLD NEW ENGLAND. By George Francis Marlowe. 200 pp.; illustrated. The Macmillan Co. $3.50.

Mr. Marlowe—able architect, historian, traveler, and writer—strongly recommends following the old post and coaching roads, to explore New England. After reading his delightful book, I'm inclined to agree.

In this smooth-flowing account (illustrated, by the way, by the author himself) he takes the reader over five of these roads. Besides the roads themselves, a connecting link is formed by the inns and taverns. Many of these have disappeared through the years, but others remain. All are rich in history, and delectable tidbits are constantly recalling to mind events of our early history.

What roads? Well, the Old Boston Post Road is here, of course, passing through familiar Connecticut landscape on the way between the two ports. The Middle Road and the Lower Post Road are traveled. By southern New Hampshire and the upper Connecticut valley runs the Groton, Keene, and Hanover Road to the foothills of the Green and White Mountains. And the Newburyport and Portsmouth Road passes dunes and sea when taking you to those towns. Together they cover some of New England's most charming scenery, delightfully described.

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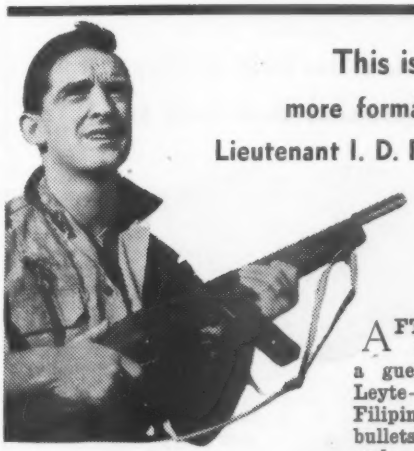

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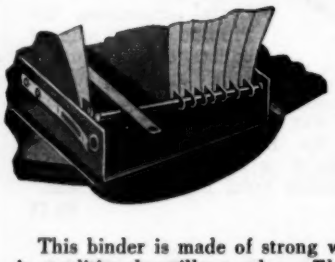

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WILLIAM THE SILENT, PRINCE OF ORANGE. By C. V. Wedgwood. 296 pp.; index; illustrated. Yale University Press. $3.00.

Born in 1533 and assassinated 51 years later, William of Orange was a contemporary of Elizabeth of England, Philip of Spain, Don John of Austria. His was an age of wars of religious intolerance and of new tides of nationalism. William was eventually a victim of the first, but before he died he had immensely helped the latter.

William laid the foundations of modern Holland. He united the people, and secured freedom from Spain. A moderate and tolerant man, he was "intolerant of intolerance." He did as much to save his people's individual rights even against their demands, as he did to obtain national freedom.

In telling this story Miss Wedgwood combines scholarly accuracy with vivid, dramatic writing. General readers will enjoy this biography as a tale of adventure. Those interested in the region or the time will find a sound and penetrating account.

GREEN ARMOR. By Osmar White. 288 pp.; maps. W. W. Norton & Co. $3.00.

One of the war's most important areas—and one most neglected in dispatches—was New Guinea. Moresby's importance is of course known, and there have been bits about the terrors of the Owen Stanleys and the high-tide of the Japanese push, but rounded accounts are few.

Now we have an outstanding story by a young New Zealander who knew this section well before the war. As a war correspondent he covered it thoroughly—and I mean *covered*, literally, and much of it on foot. He journeyed by tramp steamer along the coast, by canoe and launch into the interior, by trail over the mountains. He vividly describes the mountains and swamps, rain and mud, open grasslands, natives and old timers, and the fighters of several countries.

Besides giving an intimate and graphic picture of physical, military, and living conditions on New Guinea, Mr. White tells of the secret invaders—those old-timers and commandos who have preceded the official forces onto so many Pacific isles. The account ends with the New Georgia operation, the first one which really profited from the bitter lessons of New Guinea and the hard-learned ones of Guadalcanal.

WHAT TO DO WITH JAPAN. By Wilfred Fleisher. 178 pp. Doubleday, Doran & Co. $2.00.

Not so long ago Mr. Fleisher drew on his quarter-century experience in Japan, to write *Volcanic Isle* and *Our Enemy Japan*. Since then events have moved so fast that now this new theme is definitely a timely one. That is not to say that the war is over. It isn't. But it is high time we are considering what will be done with the vanquished.

Mr. Fleisher doesn't just give his own ideas. Upon investigating the possibilities of the future, he found that a pattern for Japan's treatment already existed. On the basis of both that and his own intimate knowledge of the Japanese, he has written in a way that is probably a fair preview of the peace to come. Let us hope it is accurate, for it has the sound of rightness.

Political, economic, and military matters are considered. Japan's constitution and its background are examined, and reasons for change given. Mr. Fleisher believes that the institution of the emperor must be retained, although Hirohito himself must go. Discussion of stripping Japan of her conquests is on a practical plane, and sound suggestions are given for the future of each one of them. Of at least equal interest and value is the chapter on the occupation and disarmament of Japan proper.

NO TRAVELER RETURNS. By Henry Shoskes; ed. by Curtis Riess. 267 pp. Doubleday, Doran & Co. $2.50.

In vivid and often gruesome detail, are recounted authentically the tribulations of the Jews of Warsaw's ghetto.

THE MUZZLE-LOADING RIFLE . . . Then and Now. By Walter M. Cline. 162 pp.; illustrated. Standard Printing & Publishing Co. $7.00.

About 15 years ago began a revival of match-shooting with muzzle-loading rifles. Mr. Cline was a leader in this movement. But long before then he was well acquainted with muzzle-loaders, which have never lost their popularity—or daily use—in our southern mountains. Through the years there have always been a few men not of the hill

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